



ADAPTATION FUND

AFB/PPRC.29-30/1
12 April 2022

Adaptation Fund Board
Project and Programme Review Committee

**REQUEST FOR CHANGE OF PROJECT OUTPUTS
AND RELATED INDICATORS, BUDGET REVISION AND
AMENDMENT OF DISBURSEMENT SCHEDULE: IFAD
(LEBANON)**

Background

1. The Adaptation Fund Board (the Board) at its eighteenth meeting, approved the project titled "Climate Smart Agriculture: Enhancing Adaptive Capacity of the Rural Communities in Lebanon (AgriCAL)", submitted by the International Fund Agricultural Development (IFAD) for a requested amount of US\$ 7,860,825 (decision B.18/18).
2. The objective of the project is to increase community resilience and adaptive capacity to climate change in Lebanon by assisting communities in adapting by improving water harvesting and irrigation technologies, setting up early warning systems and integrated production and protection of crops, introducing adapted crop varieties to future climate conditions, introducing risk-coping agriculture techniques, and assessing the carrying capacity of rangeland in order to increase their resilience to climate change and improving the management of rangelands used by goat and sheep herders.
3. The project includes four main components: (i) Increased water availability and efficient use through water harvesting and irrigation technologies; (ii) Increased adaptation to climate change for crop production; (iii) Increased resilience of shepherds and small ruminants to climate change through sustainable rangeland management; and (iv) Climate index insurance initiated, policy influenced, and lessons learned and shared through a knowledge management system.
4. As mandated by the aforementioned decision, an agreement was prepared and signed between the Board and IFAD in January 2012. The first tranche of disbursement for the implementation of the project was released following the signature of the agreement.
5. The inception report for the project was submitted in September 2015. As of March 2022, a total amount of US\$ 8,399,000 had been disbursed to the project by the Trustee. The first project performance report (PPR) for the project was submitted in September 2019 and cleared by the secretariat in August 2020. The second PPR was submitted in May 2021 and cleared by the secretariat in July 2021. The third PPR was submitted along with the request for project output revisions in January 2022.
6. As of March 2022, the project has received three extensions of the project completion date. The first extension request for a 17-month extension of the project completion date, from November 2017 to April 2019 was approved through Decision B.30-31/6. A second extension request for an 18-month extension of the project completion date from 21 April 2019 to 21 October 2020 was approved through Decision B.32-33/18. Finally, the third extension request for an 18-month extension of project completion date from 21 October 2020 to 21 April 2022 through Decision B.35.a-35.b/42.
7. A fourth extension of the project completion date by an additional 18-months from 21 April 2022 to 21 October 2023 was submitted by the implementing entity along with the proposal package for project output modification in January 2022.

Implementing Entity Request

8. The characteristics and associated rationale for project change are as follows:
 - a) *Request for extension of project completion date:* Lack of government, slow and inefficient governmental decision-making processes, and internal political struggles

resulted in prolonged time periods without a recognized government to approve project documents, budgets and work plans. The project start-up was further hampered by delays in the preparation of a Decree required to authorize the transfer of funds from the Ministry of Finance to AgriCAL's designated account. Frequent changes of governments resulting in the changing of the Ministers of Agriculture and Finance also caused delays in signing and approving all documents and transactions related to the project. Further to this, the impact of Coronavirus-19 pandemic and the most recent economic crisis on AgriCAL continues to be very significant. Constant lockdowns in the country have drastically slowed down the progress of the project and the economic situation in the country, marked by the devaluation of the local currency and the local banks inability to provide USDs to their depositors, put a complete stop to the project progress.

- b) *Revision of the project output indicators and associated targets:* A number of amendments are proposed to ensure that the project activities remain relevant to the current context. The changes do not result in a change of the overall objective of the project, but instead the proposed changes to the project activities would better meet that overall objective of the project considering current situation. The main change is with respect to increasing the supplementary water available from 75,000m³ to 406,800 m³. A number of other amendments are proposed including the cancellation of outputs:
- i. Revision of target for output 1.1 'Rainwater harvested from greenhouse rooftops from 135.5 hectares to 0.5 hectares as most beneficiaries in the target area (Qasmiyeh plain), already own Single Span Greenhouses (SSG) as well as, the cheaper Arched Tunnel Greenhouses (ATG). The Ministry of Environment (MoE) consequently requested that the project not provide greenhouses to beneficiaries that already own them and instead will conduct two greenhouse demonstrations with rooftop water harvesting to the farmers in the surrounding Byblos area to demonstrate the benefits of the technology.
 - ii. Output 1.2: Rainwater harvested from roads was deemed to be not economically feasible and is proposed to be cancelled in favour of the former output 1.3, now output 1.2 'Improved access to climate-resilient water & Water efficient irrigation systems deployed' (former output 1.3 'Water efficient irrigation systems deployed').
 - iii. Revised output 1.2 will ensure access by the AgriCAL beneficiaries to the water available in the 12 Hill Lakes developed under the Hilly Areas Sustainable Agriculture Development Project (HASAD) project. To achieve this, it is proposed that AgriCAL would construct 27.1km of irrigation network for 10 of these hill lakes in order for the water to reach the farmers living in the surrounding areas, while taking into consideration that the remaining two networks have been successfully constructed by the World Food Programme (WFP) in early 2021. AgriCAL is expected to ensure that 262 hectares, comprising 698 farms, will be made climate-resilient.
 - iv. Output 2.1 'Enhanced early warning system to farmers through improved existing systems', will revise targets from two weather stations to 12 weather stations.
 - v. Output 2.2 'Expanded farmer outreach and ensured financial and management sustainability of the warning system' will increase the target beneficiaries from 20,000 beneficiaries to 60,000 beneficiaries.
 - vi. A downward revision of the number of target sites under Output 2.3 'Capacity building on adaptation techniques for vulnerable field crops enhanced' from

three to two sites is proposed due to the fact that it would need more than 20 weather stations in place in order for implementation to commence. The fact that this number of weather stations do not exist in the area makes it impossible to implement the activities under this output.

- vii. Related to output 3.2 'Restored degraded rangeland areas and reduced flood risks', the target area of the flood control intervention is increased from 166 km to 366 km. This is due to the fact that the Ministry of Agriculture (MoA) advised the project that the most urgent and substantial need is in flood reduction. The MoA remains committed to implementing rehabilitation works in the target watersheds upon completion of the flood control measures/structures.
 - viii. Output 4.1 of the original project document included the piloting of a climate index-based insurance. However, during the initial assessment, the feasibility of the activity was questioned for a number of reasons. Chief among these is that the required meteorological infrastructure on the farmers lands do not currently exist which makes the piloting of the climate-based insurance not feasible. Additionally historical meteorological data is not available on selected crops within the same region to assess weather patterns and impact for comparative purposes. Finally, insurance companies would need to be willing to engage with and insure farmers, which is not the case.
 - ix. Finally, output 4.2 (former output 4.3) 'Knowledge management system established, and knowledge management activities implemented' for which by year four at least eight policy briefs were to be identified. Upon review the project is only able to identify four policy briefs.
- c) *Budget revision, material change and modification of disbursement schedule*: the proposed changes in project outputs and related indicators, required a budget reallocation for some outputs, which involves approximately 37% of the budget, and therefore constitutes a material change as outlined in Annex 7 of the OPG (see revised budget in Annex 2). Finally, IFAD is requesting an amendment to the project disbursement schedule, to better reflect the revised work and procurement plan, in accordance with the proposed outputs changes. The revised disbursement schedule presents the same project total amount and the same project fees as those approved through decision B.18/18, and the proposed changes are related to the size of the last two individual tranches (see section H of revised project document in Annex 6).

9. Based on the above observations, the secretariat shared relevant provisions of the Fund's Operational Policies and Guidelines and its annexes (notably annex 7 as approved in October 2017) with the Implementing Entity (IFAD), including the following:

"12. For changes in project output or outcome indicators and/or associated targets, including modifications and deletions, on the understanding that such changes would only be accepted in exceptional circumstances and up to the submission of the first Project Performance Report for the project/programme, the implementing entities should:

- (i) obtain prior approval from the Board following a full technical review of the revised fully-developed project/programme document by the Project and Programme Review Committee;
- (ii) communicate such changes to the secretariat; and
- (iii) submit a letter from the designated authority endorsing such changes to the

secretariat, for the purposes of such technical review and approval”.

10. It subsequently requested the Implementing Entity (IFAD) to submit the request for changes alongside relevant documents, including letters from designated authorities, which IFAD submitted in February 2022.

11. In accordance with the aforementioned provisions of the OPG, the secretariat carried out a full technical review of the revised fully-developed project proposal and completed a review sheet. The secretariat shared this review sheet with IFAD and offered it the opportunity to provide responses before the review sheet was sent to the PPRC.

12. The secretariat is submitting to the PPRC its analysis and, pursuant to decision B.17/15, the final technical review of the project prepared by the secretariat, along with the final submission of the proposal included as an annex (Annex 6). In accordance with decision B.25.15, the proposal is submitted with changes highlighted between the initial submission and the revised version.

Secretariat’s review of the request

13. Following a review of the request, the secretariat finds that despite the proposed changes in the project outputs and indicators and a revision of the budget, the project still delivers the same overall objective and adaptation benefits including: (i) The project is expected to reach over 73,355 individuals either as direct or indirect beneficiaries which exceeds the target set at project approval, and (ii) Under Outcome 1 the project proposes to increase the supplementary water available from 75,000 cubic meters to 406,800 cubic meters. Further, to address sustainability concerns around the water networks, the Green Plan¹ will provide institutional capacity development including technical capacity building and support to the water committees and Water User Associations (WUAs). The project will also cooperate with relevant municipalities and WUAs to agree on the fee to be charged to the beneficiaries for the provision of the irrigation service to ensure proper operation and maintenance of the networks.

14. In terms of compliance with the Fund’s environmental and social policy (ESP) as well as gender policy (GP), as part of the formulation of the proposed project changes, consultations have been conducted with key stakeholders including representatives from the government, United Nations agencies and beneficiary communities. Consultations that shaped the proposed revisions included consultations to (i) align the project activities with stakeholder needs, (ii) identify the specific needs and specific concerns of vulnerable groups and (iii) identify potential environmental and social impacts according to the 15 principles of AF’s ESP and its GP. The outcomes of consultations with the primary beneficiaries i.e., farmers and shepherd communities and their views on planned interventions in addressing declining water availability, reducing flood risk and increasing the participation of women and youth in livelihood activities are highlighted in the revised proposal and consultation reports.

15. In light of the proposed revisions, the project conducted a revised ESP risk assessment and submitted an updated Environmental and Social Management Plan (ESMP) for the secretariat’s review. A revised Gender Assessment was also submitted. It is worth noting that the original AgriCAL project that was approved in 2012 did not have an elaborate Environmental

¹ The Green Plan is a government body under the Ministry of Agriculture, Lebanon. Green Plan activities include: Land terracing, development and conservation, water harvesting and watershed management, agricultural roads construction, reforestation and seedling distribution

and Social Management Plan (ESMP) since Adaptation Fund's Environmental and Social Policy (ESP) was only adopted in 2013. The proponent has made every effort to ensure that risk assessments have been adequately updated and reflect appropriate clarifications for their findings. The secretariat will ensure compliance of this revised project with the ESP and GP of the Fund also during project implementation, through the regular reporting on environmental and social risks and gender issues, included in the project performance report (PPR).

16. It should be noted that the proposed changes in project outputs and related indicators, required a budget reallocation for some outputs, which involves approximately 37% of the budget, and therefore constitutes a material change as outlined in Annex 7 of the OPG. It is important to underline that, even though budget reallocation is significant, this is in line with the proposed changes and with the overall objective of the project. Major budget reallocations are under output 1.2 'Improved access to climate-resilient water & Water efficient irrigation systems deployed' is aligned with the objective to increase water availability for 150 hectares of farmlands. The addition of the construction of the primary networks of the 10 hill lakes by AgriCAL has increased the output budget from USD 426,000 to USD 1,814,000. As a result of the output revision, AgriCAL will ensure that 262 hectares, comprising 698 farms, will be made climate-resilient.

17. Sustainability of water networks is expected to be ensured by the Green Plan which will provide institutional capacity development including technical capacity building and support to the water committees and WUAs. 10 out of the 12 hill lake networks will be managed by the municipalities who are well capacitated in terms of financial and maintenance follow up. The remaining two networks will be managed by WUAs and Green Plan. Rangeland interventions sustainability is ensured by the participatory approach taken to develop the rangeland management plans that ensure community ownership.

18. A budget increase under outputs Output 2.1 'Enhanced early warning system to farmers through improved existing system' is justified given Lebanese Agriculture Research Institute's (LARI's) current assessment revealed that more weather stations are needed in the project area. In parallel, the budget under the revised output 2.2 'Expanded farmer outreach and ensured financial and management sustainability of the warning system' was decreased as a result of the success of the Public Private Partnership (PPP) between LARI and Debbane Company, the manufacturer of the weather stations currently used by LARI all over the country. This reduced the cost of this output from USD 100,000 to USD 25,000.

19. The major change under Output 3.2 'Restored degraded rangeland areas and reduced flood risks' which increased the budget for the output (original budget: 1,970,000; revised budget, USD 2,691,000) is justified given the most urgent and substantial need is in flood reduction in the target areas. The original project design aimed to focus on the rehabilitation of two watersheds (in Faara and Nahle) covering 166 km with the aim to reduce the impact of floods, restore the vegetation of the degraded upper water-catchments to facilitate increased water infiltration and reduce surface runoff. The inclusion of Al-Qaa watershed was necessary since it became increasingly more dangerous, thus increasing the project's total coverage of the flood control intervention from 166 km to 366 km.

20. The project results framework, including milestones, targets and indicators presented in section E of the revised project document captures the changes in outputs, indicators and targets (Annex 6). In addition, the project restructuring paper (Annex 4) offers details on the proposed revisions in the results framework.

21. In light of the cancelled output 4.1 'Climate index-based insurance initiated', the outcome indicators of the project are no longer aligned with the AF outcome 2: 'Strengthened institutional capacity to reduce risks associated with climate- induced socioeconomic and environmental losses and the related output indicator 2.2.1. 'Percentage of population covered by adequate risk- reduction systems. Consequently, these have been removed and changes are reflected in the revised results framework table.

22. Finally, IFAD is requesting an amendment to the project disbursement schedule, to better reflect the revised work and procurement plan, in accordance with the proposed outputs changes. The revised disbursement schedule presents the same project total amount and the same project fees as the ones approved through decision B.18/18, and the proposed changes are related merely to the size of the last two individual tranches (see section H of revised project document).

26. The initial technical review was conducted to ensure compliance with the Fund's Environmental and Social Policy and Gender Policy considering the proposed modifications. The technical review also revisited the criteria of cost-effectiveness, the sustainability of the proposed interventions and benefits to the target communities. A number of clarification requests (CRs) and corrective action requests (CARs) were raised as detailed in the review sheet which was shared with IFAD (Annex 5). The final technical review finds that IFAD had adequately addressed all the issues raised.

Recommendation

23. Having considered document AFB/PPRC.29-30/1 and its annexes, the Project and Programme Review Committee (PPRC) may wish to recommend that the Board decides to:

- a) Approve the changes in project outputs, related indicators and targets, the budget reallocation at output level and the amended disbursement schedule for the project "Climate Smart Agriculture: Enhancing Adaptive Capacity of the Rural Communities in Lebanon (AgriCAL)", as requested by the International Fund Agricultural Development (IFAD) and as contained in the revised project proposal presented as Annex 6 of document AFB/PPRC.29-30/1;
- b) Approve the request for an 18-month no-cost extension of the project completion date from 21 April 2022 to 21 October 2023
- c) Request the secretariat to draft an amendment to the agreement between the Board and IFAD to reflect changes made under subparagraph a).

Annexes

Annex 1: Letter by the Designated Authority for Lebanon endorsing the proposed changes

Annex 2: Letter from the Executing Entity, Ministry of Agriculture requesting extension and changes

Annex 3: Request for Extension of project completion date

Annex 4: Material Change and project revisions justification note

Annex 5: Project technical review undertaken by the AFB Secretariat and shared with IFAD

Annex 6: Revised proposal document with tracked changes addressing comments made by the secretariat in its initial review

Annex 1: Letter by the Designated Authority for Lebanon endorsing the proposed changes



REPUBLIC OF LEBANON
MINISTRY OF ENVIRONMENT

THE MINISTER

Beirut, 13/12/2021

Our Ref: 3929/B²⁰²¹

Ms. Dina Saleh
Director
Near East, North Africa and Europe Division
International Fund for Agriculture Development (IFAD)
Rome, Italy

Subject: Request for no-cost extension and budget reallocation to the Climate Smart Agriculture: Enhancing Adaptive Capacity for the Rural Communities in Lebanon – AgriCAL.

Reference: Letter of the Ministry of Agriculture ref. 3929/B dated 13/12/2021
Letter of Ministry of Agriculture to IFAD ref. 6229/3 dated 13/12/2021

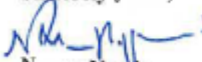
Following the Ministry of Agriculture's request for an extension for the Climate Smart Agriculture: Enhancing Adaptive Capacity of the Rural Communities in Lebanon – AgriCAL project which is being implanted in Lebanon by the International Fund of Agriculture Development (IFAD) with a grant funding from the Adaptation Fund;

And given the importance of the AgriCAL project in supporting rural areas in adapting to the socioeconomic and environmental impacts of climate change, which have been delayed since the recent COVID19 pandemic,

The Ministry of Environment, in its capacity as the Adaptation Fund Focal Point of Lebanon, requests IFAD a no-cost extension of the AgriCAL project for 18 additional months (from 21st of April, 2022 until 21st of October, 2023).

The Ministry of Environment is looking forward to continuing the collaboration with the Ministry of Agriculture and the AgriCAL project team to fulfill Lebanon's National Determined Contribution (NDC) to the United Nations Framework Convention on Climate Change (UNFCCC).

Sincerely yours,


Nasser Yassin
Minister of Environment



Cc:

- H.E. Abbas Al-Hajj Hassan, Minister of Agriculture, Ministry of Agriculture – Office of the Minister
- MoE-DGoE – 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-V1-1/1

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Annex 2: Letter from the Executing Entity endorsing the proposed changes

Republic of Lebanon
Ministry of Agriculture
Minister

no 6129 / 3

Ms. Dina Saleh
Director
Near East, North Africa and Europe Division
International Fund for Agricultural Development (IFAD)
Rome, Italy

Subject: Climate Smart Agriculture: Enhancing Adaptive Capacity of the Rural Communities in Lebanon - AgriCAL - Request for no-cost extension

Dear Ms. Saleh,

First of all, I would like to convey the sincere recognition of the Ministry of Agriculture to IFAD for supporting the Government of Lebanon through the project Climate Smart Agriculture: Enhancing Adaptive Capacity of the Rural Communities in Lebanon – AgriCAL (Grant No: C-AF-I-LB). I would like to extend the Ministry's gratitude for continuous technical support towards achieving the project objectives.

The AgriCAL project faced a lengthy delay in starting up due to the delayed establishment of new fund management procedures in Lebanon. The agreement was signed in November 2013, but inception activities only started in March 2017, with the establishment of the Project Coordination Unit (PCU).

1. The Climate Smart Agriculture: Enhancing Adaptive Capacity of The Rural Communities in Lebanon (AgriCAL) is completing on the 21st of April, 2022. The AgriCAL progress was considerably hindered throughout the years due to a number of external factors outside the project's control.
2. The impact of COVID and the most recent economic crisis on AgriCAL continues to be very significant. Constant lockdowns in the country drastically slowed down the progress of the project. Moreover, the economic situation in the country, marked by the devaluation of the local currency and the local banks inability to provide USDs to their depositors, put a complete stop to the project progress. The project's inability to access funds in its designated account resulted in near zero disbursements in the past year.
3. To date, the project has disbursed **16.23%** of its overall budget and the time remaining for its completion will not be enough to complete its activities. Furthermore, some activities envisaged in the original project design cannot be implemented given the time constraints and the substantial situational changes on the ground since the date of the original project design.
4. The most recent and most serious issue faced by the project was its inability to access the funds in its Designated Account. This was due to the fact that as a result of the economic crisis that the country is facing, the Banque Du Liban (BdL) prohibited all government projects from disbursing

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what is known as "Fresh Money". This meant that if AgriCAL wanted to pay its vendors, it will have to pay using "None-Fresh Money" which in turn means that the vendors will only receive payment in local currency (LBP).

5. The Ministry of Agriculture, the IFAD country team, and the AgriCAL PCU held a meeting with BdL and the Ministry of Finance on the 17th of March 2021 to find a solution for this issue. An agreement with BdL was reached in which the money in the AgriCAL Designated Account will be considered as "Fresh Money" to enable payment for Civil Works and Goods. Other activities such as consultancies and Project Implementation Costs (PEC) will be paid with "None-Fresh Money" and this is acceptable and implementable. This agreement by BdL was the first of its kind for any donor-funded project in the country.
6. With this agreement, the AgriCAL project showed significant accelerated progress where contracts valued at **USD 1.3 million** signed and physical progress in the 10 hill lakes and Abdeh Nursery is almost 100% in a very short period of 6 months. The project's ability to achieve such significant progress in 6 months illustrates that the fundamental issues that previously hindered implementation have been resolved and should no longer affect the project in the coming period. It is expected that the project will disburse approximately USD 2.5 million from June 2021 to April 2022 (i.e. 35% of total funding in 10 months).
7. The current request proposes a no-cost extension of the project by an additional 18 months – until 21st of October, 2023 – thus allowing the project to complete its planned activities.
8. A strong rationale behind the extension has been jointly developed by the AgriCAL PCU and the IFAD country team is attached to this letter.

AgriCAL remains a national priority, in light of the evidence of climate change visible in Lebanon for a few years on one hand, and the socioeconomic and environmental pressures that prevail over the country since the onset of the COVID pandemic, the recent economic crisis, and the Syria crisis. Rural areas and their inhabitants are particularly suffering from those combined factors. The project would support alleviating these pressures.

The Government of Lebanon reiterates its commitment to make all the necessary institutional, technical, and administrative support to enable AgriCAL to achieve its objectives. The PCU team is committed and determined to reach the best results by the end of the proposed date (subject to the extension and budget reallocation request).

Please accept, Ms. Saleh the assurance of my deepest appreciation.

Minister of Agriculture

Dr. Abbas Al-Hajj Hassan



Handwritten signature in blue ink.

Request for no-cost extension

**Climate Smart Agriculture: Enhancing Adaptive Capacity of the Rural
Communities in Lebanon (AgriCAL)**

Annex 1: Implementation progress to date

1. Project Progress by Component

1.1 Component One: Water Management

1.1.1 Implementing Agency: Green Plan

As known, among the hill lakes implemented by HASAD project and funded by IFAD, twelve (12) hill lakes need the installation of the main irrigation network to liaise the hill lake to farmer areas.

Table 1. Volume for the twelve (12) hill lakes and length of each irrigation network

#	Hill Lake name	Caza	Volume (m ³)	Length of the irrigation network (km)
1	Ehmej	Jbeil	30,000	2.4
2	Beit Lif	Bet Jbeil	28,000	1.8
3	Nahleh	Baalback	20,000	1.55
4	Ain Bnayeh	Baalback	30,000	1.5
5	Menjez	Akkar	46,000	3.9
6	Kfarchouba	Hasbaya	45,000	2.7
7	Medwe	Baalback	53,500	2.35
8	Barqa	Baalback	40,000	2.97
9	Zrazir	Baalback	45,000	4.2
10	Qornayel	Metn	20,000	1.5
11	Deir El Moukhalles	Chouf	55,000	3.5
12	Kaïkab	Hermel	67,000	2.63

1.1.2 Progress on Key Milestones: output 1.3: Water-efficient irrigation systems deployed

1.1.2.1 Expected Progress

- a) Potential for water-efficient irrigation assessed
- b) Tender documents prepared
- c) Farmer awareness raised
- d) Equipment procured and installed

1.1.2.2 Key achievements

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This component showed significant progress in the implementation of the work.

- The supply and installation of an irrigation network for the two hill lakes (Medwe and Nahle) were funded by WFP and the implementation was done completely. A formal document was received from WFP acknowledging consulting the studies by AgriCAL for the development of the irrigation networks.
- Ten contracts related to the supply and the installation for the remaining hill lakes were signed in June 2021 to be implemented in 2 months (September 2021) from the start date. Regarding the fuel and diesel shortage and road closing, the intended completion date was extended for two additional months (November 2021). Two of them were implemented completely and more than 90% of the works were done for the remaining eight networks.
- Minor works in four signed contracts were amended based on the beneficiaries' needs.
- When the Project launched the bidding process for the implementation of the irrigation networks for nine of the hill lakes (except ain al Bnayeh), the municipalities expressed their willingness to cover the cost of the construction of the filtration room (a concrete room supposed to contain and protect the filters of the irrigation networks from thefts). However, the difficult economic conditions that the country is going through and the loss of the national currency value have negatively affected the municipal budget, which becomes unable to carry out any work on their expenses. Therefore, to maintain the sustainability of the irrigation networks, the project team decides – after getting IFAD No objection – to sign contracts with the same contractors – via Direct Contracting - to construct the filtration rooms. Therefore, three additional contracts were signed on November 9, 2021, to implement the filtration rooms.
- The Contract with the engineer in charge of supervising the implementation of irrigation networks for three hill lakes was signed in June 2021 and amended till the implementation of irrigation networks.

Payments terms

As mentioned above, more than 90% of the works in the irrigation networks related to the irrigation networks are implemented. The project needs to pay the contractors.

Regarding the actual status of the project bank account and based on the minutes of discussion with the contractors, the contracting authority and the PMU are in a very critical situation towards the contractors.

Reference made to the last version of the LTR, the project has to proceed with the payments for the two contractors who implemented the works, detailed payments shown in table 3.

- US\$ 124,905.04 to the Contractor "Al Fares for Trading and Contracting". This amount represents the sum of four (4) different invoices due to the implementation of four (4) contracts.

- US\$ 484,424.61 to the Contractor "Gitani Brothers s.a.r.l. This amount represents the sum of five (5) invoices due to the implementation of five (5) contracts

- Regarding that the payment amount (US\$ 68187.20) related to the third contractor Al Moustafa for Trading and Contracting Company is less than US\$ 100.000. The project will pay the amount from the project bank account.

Table 2. Summary of the completed works related to the irrigation networks and the relevant payments

Contract Name	Contractor	Contract Number	Contract Amount	% of completed works	Amount to be paid
Supply and Installation of irrigation network for Beit Luf hill lake	Al Fares for Trading and Contracting	3228/3	42,372.80	94%	34,318.04
Supply and Installation of irrigation network for Deir El Mokhaless hill lake	Al Fares for Trading and Contracting	3229/3	66,858.25	91%	24,461.48
Supply and Installation of irrigation network for Kfarhouba hill lake	Al Fares for Trading and Contracting	3227/3	83,756.53	97%	54,082.34
Supply and Installation of irrigation network for Qornayel hill lake	Al Fares for Trading and Contracting	3230/3	34,039.32	93%	12,043.18
Total of payments to Al Fares for Trading and Contracting					124,893.96
Supply and Installation of irrigation network for Ehmei hill lake	Al Moustafa for Trading and Contracting Company	3041/3	111,880.00	100%	68,197.00
Total of payments to Al Fares for Trading and Contracting					68,197.00
Supply and Installation of irrigation network for Menjez hill lake	Gilani Brothers s.a.r.l.	3233/3	121,475.00	94%	71,955.95
Supply and Installation of irrigation network for Ain Brisyeh hill lake	Gilani Brothers s.a.r.l.	3235/3	84,947.15	100%	63,512.09
Supply and Installation of irrigation network for Barqa hill lake	Gilani Brothers s.a.r.l.	3236/3	116,593.98	93%	96,822.77
Supply and Installation of irrigation network for Kaikab hill lake	Gilani Brothers s.a.r.l.	3232/3	116,050.10	93%	95,380.80
Supply and Installation of irrigation network for Zradir hill lake	Gilani Brothers s.a.r.l.	3234/3	193,926.50	98%	156,753.69
Total of payments to Gilani Brothers s.a.r.l.					484,421.3

A.H.H.

1.2 Component Two: Adaptation Techniques Roll-out

3.2.1 Implementing Agency: Lebanese Agricultural Research Institute

During the reporting period, all activities related to the weather stations, EWS software, and the website such as climate risk information and pest forecasting were not implemented.

Upon the support mission recommendation (August 2021), AgriCAL project will direct contracting Debbane firm who will supply the EWS and the weather stations and sustain the system for the coming five years.

The preparation of different guidelines on agricultural adaptation techniques was approved by IFAD and the preparation have started in March and is in progress.

1.2.2 Progress on Key Milestones: Output 2.1: Enhanced early warning system to farmers through improved existing system

1.2.2.1 Expected Progress

- a) Gaps and needs assessed
- b) Weather stations procured and installed

1.2.2.1 Key achievements:

- The contract was signed for the purchase of equipment for LARI's training center on October 4, 2021, and the estimated delivery date is November 8, 2021. (The Delivery occurred on November 9, 2021)
- The contract was signed for the purchase of multifunctional printers in July 2021 and the delivery occurred in September 2021.
- IFAD gave a No Objection for direct contraction for the procurement and the installation of 3 weather stations and early warning system on October 27, 2021, with Debbane a local company. The RFQ was sent to Debbane on October 28, 2021, the project received a response from the company (November 19, 2021) and is preparing the direct contract. (The contract is signed by Debbane Freres on 26/11/2021 and we will proceed to get the Minister's signature)

1.2.3 Progress on Key Milestones: Output 2.2: Expanded farmer outreach and ensured financial and management sustainability of the warning system

1.2.3.1 Expected Progress

- a) Developing financing mechanism

1.2.3.2 Key achievements

No achievement.

1.2.4 Progress on Key Milestones: Output 2.3: Capacity building on adaptation techniques for vulnerable field crops enhanced

1.2.4.1 Expected Progress

- a) Managerial capacity of LARI assessed
- b) Adaptive techniques and climate-vulnerable crops in the target areas assessed.
- c) Demos prepared onsite.
- d) Setting up demo plots and training farmers.

1.2.4.2 Key achievements

- The contract was signed for the procurement and the installation of drip lines and flow meters as well as pesticides and fertilizer on October 4, 2021, and the estimated delivery date is January 2022.
- The contract was signed for the trainer in greenhouse, hydroponic and soilless agriculture on October 17, and the training will start soon. (Report number 1 was delivered and waiting for the comments of LARI's focal point)

- Re-launching the procurement process for the purchase of insect pheromone traps, the bid opening was done on November 1, 2021. The activity is in the evaluation process. (We are preparing the evaluation report)

- The Procurement Process for the statistics and research design trainer expert was relaunched after the withdrawal of the expert who was previously selected due to his commitment to another project, the selection committee is negotiating with the newly selected candidate. The proposal of the consultant was received on November 24, 2021.

- The Training on "Crop Water Requirement: Evapotranspiration" was held online from 5 to 8 October for 4 days, a total of 35 persons from LARI, MoA, and Universities have participated in the training from which 25 persons are women.

- The Training on "Irrigation and crop modeler" was delivered by LARI expert in October 2021, during 3 days, a total of 10 persons from LARI, MoA, and Universities have participated in the training of which 7 persons are women.

1.2.5 Progress on Key Milestones: Output 2.4 Guidelines and recommendations on agricultural adaptation techniques for vulnerable areas developed

1.2.5.1 Expected Progress

1) Guidelines and recommendations on agricultural adaptation techniques for vulnerable areas developed

1.2.5.2 Key achievements

After getting IFAD No Objection on the prepared ToRs, LARI's team started as agreed working on the following technical guidelines topics:

- Soil-borne diseases
- Cereal disease management
- IPM for peach and apricot diseases
- Rained agriculture adaptation to CC
- IPM of emerging vascular pathogens on grape
- Rainfed varieties
- Practical illustrated calendar for the fodder species grown in natural rangelands located in the North Bekaa region
- On-field compilation of data at the farm level to highlight existing agricultural practices at the farm level
- Investigating and assessing the existing agriculture machinery at the farm level

Two of these guidelines, soil-borne diseases, and the rainfed agriculture adaptation to climate change are finished, and the others are in progress.

- The procurement process to select an expert in the preparation of technical guidelines on crop rotation importance was launched, the selection committee request to re-launch another time procurement process after finding that the candidates were not qualified to do the consultancy. The consultancy was re-launched on November 19, 2021, and the deadline for submission is December 7, 2021

1.2.6 Progress on Key Milestones: Output 2.5 National Fodder Resource Assessment

1.2.6.1 Expected Progress

- Surveys conducted.

1.2.7.2 Key achievements

- LARI team started working on a pilot site for the fodder species assessment.

- The procurement process for the purchase of miscellaneous products for laboratory uses was launched on November 1, 2021. The evaluation committee is preparing the evaluation report
- The purchase and installation of a server and the needed equipment will be launched soon. We are still in market research, we are trying to find at least 7 eligible bidders who want to receive the BD.

1.3 Component Three: Rangeland Management

1.3.1 Implementing Agency: Ministry of Agriculture

The implementing agency for this component is the Ministry of Agriculture.

1.3.2 Progress on Key Milestones: Output 3.1: Community-based sustainable rangeland management plan prepared

1.3.2.1 Expected Progress

- a) Project areas assessed and selected
- b) A participatory approach was designed and community management plans developed
- c) Rangeland use maps developed.

1.3.2.2 Key achievements

- The contract was signed with the expert in rangeland management and the assignment was in progress, additional extension time for the contract was approved till December 2021. Unfortunately, due to health and financial conditions, the Consultant informed the Project lately will not be able to continue the assignment.
- The contract was signed with the participatory approach expert on June 2021 and the estimated duration of the assignment will be in January 2022. The COVID measures and the fuel scarcity delay the submission of the first report of the participatory approach expert. The acceptance is reviewing the draft report.
- The implementation of the rangeland management plan will only take place in Nabatieh as well as the training, due to limited time and financial resources.
- The contract with the supplier of feed was signed on November 15, 2021. The quantity of the concentrated feed for sheep and goats increased to 384 T, due to the inability to put feed in the ministry's centers in the Nabatieh area, the project was obliged, after IFAD and supplier approvals, to extend the delivery date from 2 months to 4 months after contract signature.
- The project is currently preparing training on animal husbandry, dairy processing for women, and beekeeping. Simultaneously, the project finished the preparation process for the procurement of fences for improved rangeland management and in the preparation phase for the documents related to the procurement of equipment for dairy processing and beekeeping equipment, vaccination campaign, and medicinal plants activity.
- The RFQ concerning the purchase of drinking troughs is prepared, due to the economic conditions and the financial situation, we are trying to find solutions to the prepayment process. The potential bidders require advance payment. In these difficult conditions, the submission of a bank guarantee in Fresh dollars against this payment is difficult to ensure.
- The activity related to linking local producers, distributors, markets, and processors will not be carried out till the execution of the different types of training and the improvement of the quality of production.
- The activities related to subcomponent 3.2: Restored Degraded Rangeland Areas and Reduced Flood Risks, the selected expert to prepare the technical specifications and the required drawings of check gabions and hafeers was no more available to undertake the assignment. The quality of works required a contract with a firm and not an individual consultant. Due to the time limitations, it was convened after IFAD mission in September 2021, that AgriCAL project will contact the CNRS (National Center for Scientific Research) as a potential firm to undertake this assignment using direct contracting process. But it revealed that the CNRS experts are capable only to do thematic maps for the watersheds and do not have the local experts to prepare the technical specifications and the required drawings.

The completion date of the project is in April 2022, the difficult weather conditions, the duration of the procurement process to select a qualified firm, make the implementation of this activity impossible with the remaining time of the project.

- The ToR for the consultant who will do the training for the local communities and DRDNR staff on the implementation and monitoring of the rangeland management plans is in process.
- The technical specifications of the beekeepers were prepared for the shepherds. The selected beneficiaries are now the beekeepers who have bees within the rangeland area being studied. The equipment and the training materials will be updated accordingly.
- The procurement and the installation of fences are in the final phase. (waiting for the tor of a company to install the fences)
- The procurement of equipment for dairy processing is in the technical specification phase. (email sent on November 16, 2021, to the technical person to finalize some technical specs and quantities required)
- The Technical specifications for the purchase of aromatic and medicinal plants are prepared.
- The vaccination campaign for the herds is within the preparation phases.
- The material for the training on animal husbandry good practices is within the preparation phase.
- The material for the training of women on dairy processing is within the preparation phase.

1.3.3 Progress on Key Milestones Output 3.2: Restored degraded rangeland areas and reduced flood risks

1.3.3.1 Expected Progress

- a) Site-specific plans elaborated
- b) Stone-check dams constructed
- c) Nurseries identified and rehabilitated/constructed.

1.3.3.2 Key achievements

- The contract was signed for the rehabilitation of MoA nursery in Abdeh in July 2021, and the delivery date was extended two additional months till January 12, 2022. RFQ for transportation of items from Abdeh to Fanar warehouse was sent to the bidder on November 24, 2021, and the submission deadline is December 2, 2021

1.4 Component Four: Climate index-based insurance, policy and knowledge Management

1.4.1 Implementing Agency: Ministry of Environment

The Project is coordinating with this Ministry of Environment through the Climate Change Unit.

1.4.2 Progress on Key Milestones: Output 4.2 Policy and advocacy activities implemented

1.4.2.1 Expected Progress

- a) Regular policy advocacy activities conducted
- b) A national forum conducted to review and integrate climate risk reduction strategies and measures into the relevant national and regional development plans
- c) Provide technical support to the climate change unit in the Ministry of Environment

1.4.2.2 Key achievements

- The Project team is preparing the ToR for the Consultant to conduct advocacy policy. No objection was received on November 21, 2021. It will be launched soon
- The Contract for the supply and installation of the rainwater harvesting system in Rihane and Bentael was signed in July 2021. The implementation of works is expected to be accomplished by mid of

December 2021.

- A Consultant was selected to supervise the installation of the rainwater harvesting system in Rihane and Bentaël. However, before the contract signature, the Consultant informed the Project that he is no more available for the assignment. The Project Coordinator select a qualified civil engineer from Green Plan for the assignment.

1.4.3 Progress on Key Milestones: Output 4.2 Knowledge management system established and knowledge management activities implemented

1.4.4.1 Expected Progress

- a) Project knowledge management system developed.
- b) Appropriate knowledge products developed and disseminated.

1.4.4.1 Key achievements

- The Contract with the videographer was signed on November 9, 2021. The Consultant started the shooting immediately to record the progress of ongoing projects mainly the irrigation networks.
- The EOI for the expert to develop appropriate knowledge products for all projects was cleared from IFAD side on October 27, 2021.
- The procurement of expert to develop appropriate knowledge products was launched on November 4, 2021. Only one candidate is eligible. An email was sent on November 24, 2021, to Mrs. Hala and Mrs. Lea, and Mr. Ali Khazaal to choose a date for an interview but no answer is received yet.

Component Five: Project Execution Cost

1.5.1 Annual Work Plan status: AWPB and PP Status

During this reporting period, several AWPBs and PPs were updated and approved.

1.5.1 Key Achievements

Audit Report for the year 2020 – 2021 for the AgriCAL project and the RPSF project

- The Audit firm "Moore Stephens and Tabbal Limited" submit the audit report and the management letter for the year 2020 in September 2021.

An amended contract was signed in May 2021 with this firm to undertake the External Audit for AgriCAL Project for the year 2021 and the RPSF project.

Administrative assistant

The project team is working without an administrative assistant since June 2019. The selection process for the administrative assistant was stopped by IFAD waiting for "the physical progress of the work". During the September 2021 mission, IFAD asked to continue the procurement process and the project continued it. Regarding that, the Project was not able to pay the consultant fresh dollars and the candidates were not interested to undertake the assignment.

The Project launched recently the selection process for this vacancy, around 355 expressions of interest were received. The selection process of qualified candidates and the contract signature will take two months at least. Since the completion period of the project is April 21, 2022, the contract duration will be only 3 to 4 months. The efforts required to continue the process were found unnecessary unless in the case of project extension.

Financial officer

Regarding that the project was not able to pay the consultants as fresh dollars, the finance and accounting officer did not accept extending his contract starting April 21, 2021, till October 21, 2022, and he joined his family in France.

The Project launched recently the procurement process for the selection of a new finance and accounting officer. Four candidates were selected. As expected, the selected candidates found other assignments paid as fresh dollars.

Recently IFAD gave us the No Objection to do direct contracting with a new Financial Officer, and the project is finalizing the procurement process.

Miscellaneous

- There were no changes within the letter to the recipient since the previous mission.
- No changes were made to the PMU.
- Contract Register

Implementation Plan & Milestones

Output 1.1: Rainwater harvested from greenhouse rooftops

The activities under this have been downscaled based on the request of MoE to include two demo greenhouses in Rihane and Bentaal. Greenhouse water harvesting structures/equipment have been installed at both sites and the MoE has formally accepted work during the field visit with H.E. the Minister of Agriculture on November 30, 2021. To ensure sustainability the MoE will sign a contract with both farmers guaranteeing demonstration access and maintenance of the installed structures/equipment.

Output 1.1: Implementation Schedule & Milestones



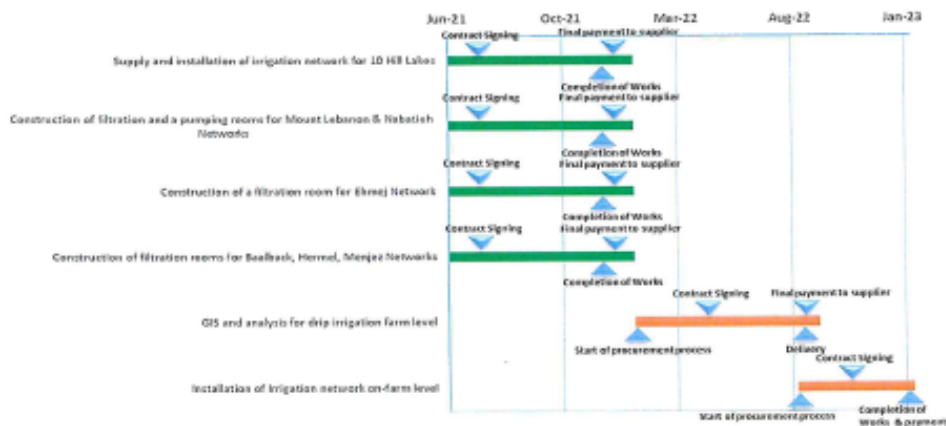
Output 1.2 Rainwater harvested from roads

In output 1.2 it was originally planned for the project to introduce water harvesting along the roads constructed by Green Plan with the objective to supply 120, 10ha farms with 50,000m³ of harvested rainwater. As part of the planned assessment as per the project document activities, it was however realized that the target area does not have a suitable location for collecting the harvested water. The Green Plan team searched and investigated over all the executed roads by the department of road and water without finding a suitable site or location close to the roads where a hill lake or large tanks can be built to store the harvested water within servicing distance of potential beneficiaries. The activity was deemed to be not economically feasible and is proposed to be canceled in favor of the former output 1.3, now 1.2 below.

Output 1.3 Water efficient irrigation systems deployed

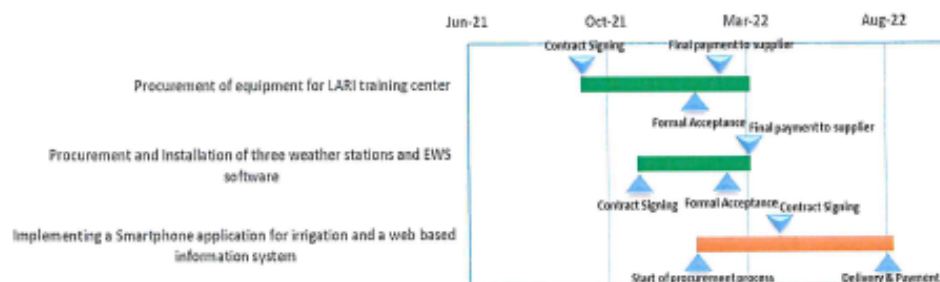
The main activities under this output are as follows:

1. Construction and installation of the primary irrigation system for 10 hill lakes (Beit Lif, Deir Mokhaless, Kfarchouba, Qornayel, Ehmej, Menjez, Ain Bnayah, Barqa, Kaikab, and Zrazir). Consecution and installation work has commenced for all 10 sites and is expected to conclude in December 2021.
2. Conducting a preliminary analysis prior to installation of secondary/on-farm networks.
3. Installation of secondary/on-farm drip irrigation networks for the 698 beneficiaries of the primary system.

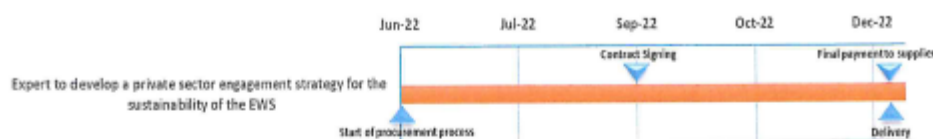
Output 1.3: Implementation Schedule & Milestones**Output 2.1 Enhanced early warning system to farmers through improved existing system**

Three main activities are included in this output:

1. Procurement and installation of equipment for the LARI training center which already commenced.
2. Procurement and installation of three weather stations in Akkar, Tel Amara, and Tyr, in addition to the procurement of the National EWS software.
3. Development of the EWS smartphone application.

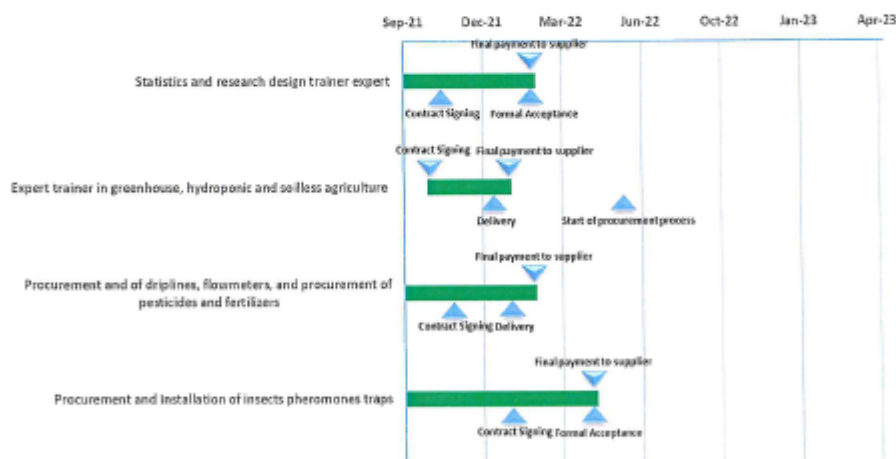
Output 2.1: Implementation Schedule & Milestones**Output 2.2 Expanded farmer outreach and ensured financial and management sustainability of the warning system**

This output only involves hiring a consultant to elaborate a private sector engagement strategy for the sustainability of the EWS.

Output 2.2: Implementation Schedule & Milestones**Output 2.3 Capacity building on adaptation techniques for vulnerable field crops enhanced**

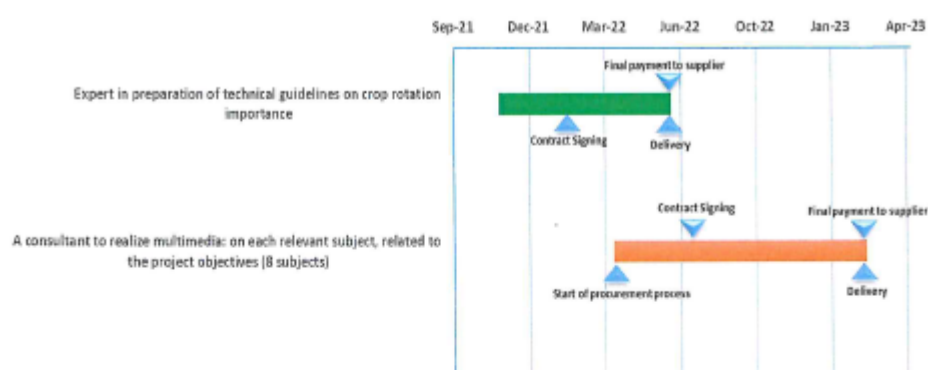
The main activities under this output include the following:

1. Training in statistics and design.
2. Expert trainer in greenhouse, hydroponic and soilless agriculture
3. Establishment of demonstration plots, crop modeling, and introduction of the smartphone application.
4. Procurement and of driplines, flowmeters, and procurement of pesticides and fertilizers.
5. Procurement and Installation of insects pheromones traps
6. Disseminating and promoting the results (Farmer Field Days)

Output 2.3: Implementation Schedule & Milestones**Output 2.4 Guidelines and recommendations on agricultural adaptation techniques for vulnerable areas developed**

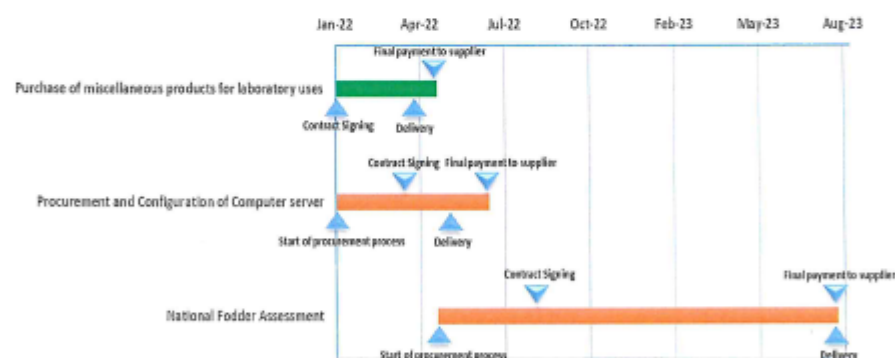
The main activities under this output include the following:

1. Expert in preparation of technical guidelines on crop rotation importance
2. A consultant to realize multimedia on each relevant subject, related to the project objectives (8 subjects)

Output 2.4: Implementation Schedule & Milestones**Output 2.5 National Fodder Assessment (NFA)**

The main activities under this output include the following:

1. Purchase of miscellaneous products for laboratory uses
2. Procurement and Configuration of Computer server
3. National Fodder Assessment including consultancies and equipment

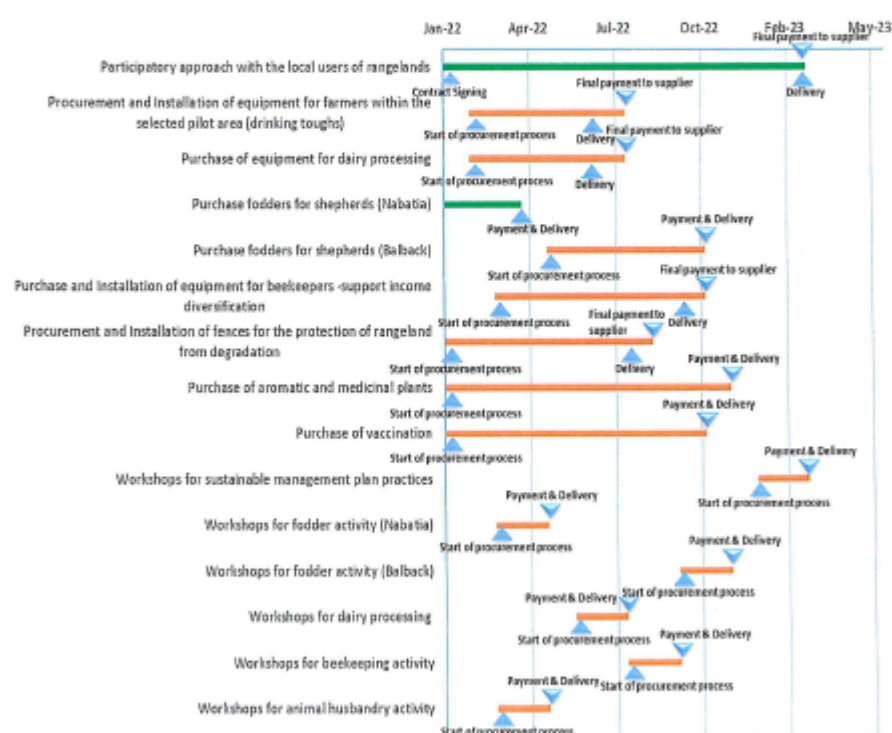
Output 2.5: Implementation Schedule & Milestones**Output 3.1 Community-based sustainable rangeland management plans prepared**

The main activities under this output include the following:

1. Participatory approach with the local users of rangelands
2. Procurement and Installation of equipment for farmers within the selected pilot area in order to apply the sustainable rangeland management practices (drinking troughs)
3. Purchase of equipment for dairy processing
4. Purchase fodders for shepherds (Nabatia)

5. Purchase fodders for shepherds (Balback)
6. Purchase and Installation of equipment for beekeepers -support income diversification
7. Procurement and Installation of fences for the protection of rangeland from degradation
8. Purchase of aromatic and medicinal plants/vaccination
9. Workshops for sustainable management plan practices
10. Workshops for fodder activity (Nabatleh)
11. Workshops for fodder activity (Baalback)
12. Workshops for dairy processing
13. Workshops for beekeeping activity
14. Workshops for animal husbandry activity

Output 3.1: Implementation Schedule & Milestones



Output 3.2 Restored degraded rangeland areas and reduced flood risks

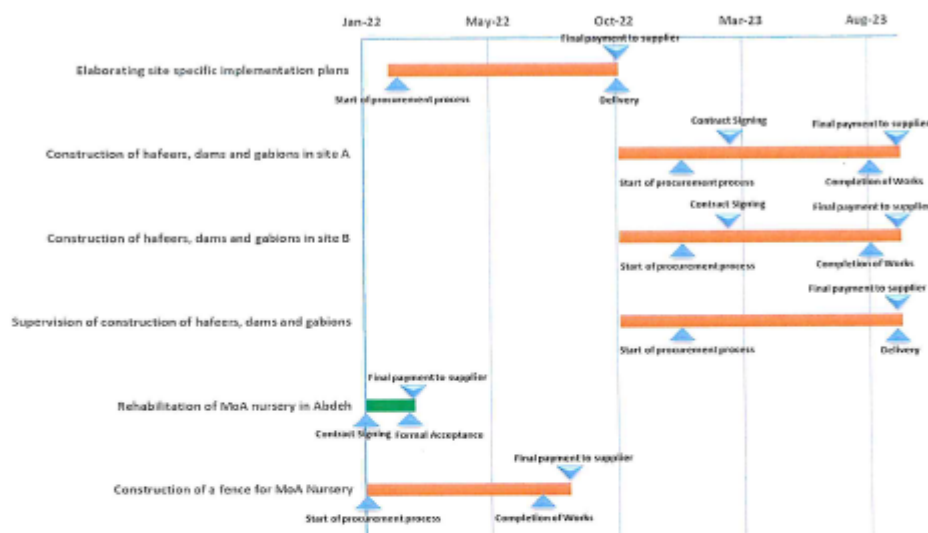
The main activities under this output include the following:

1. Elaborating site specific implementation plans

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2. Construction of hafeers, dams and gabions in site A
3. Construction of hafeers, dams and gabions in site B
4. Supervision of construction of hafeers, dams and gabions
5. Rehabilitation of MoA nursery in Abdeh
6. Construction of a fence for MoA Nursery

Output 3.2: Implementation Schedule & Milestones



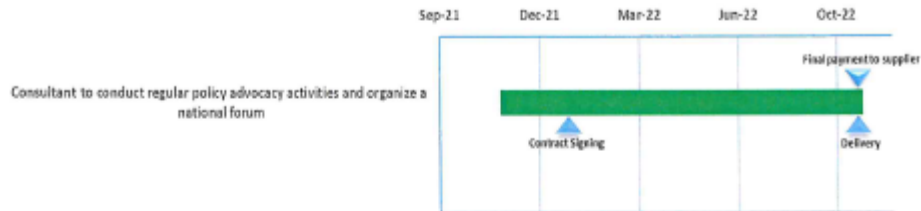
Output 4.1 Climate index-based insurance initiated

Output 4.1 of the original project document included the piloting of a climate index-based insurance however during the initial assessment, the feasibility of the activity was questioned for a number of reasons. Primarily that the required meteorological infrastructure on the farmers lands do not currently exist which makes the piloting of the climate-based insurance not feasible. Additionally, historical meteorological data is not available on selected crops within the same region to assess weather patterns and impact for comparative purposes. Ultimately it was also assessed that insurance companies would need to be willing to engage with and insure farmers, which was not the case. Despite the Ministry of Agriculture has made a number of unsuccessful attempts to develop such an insurance pilot upon request of AgriCAL, in absence of the required preconditions it is recommended that this activity be canceled.

Output 4.2 Policy advocacy activities implemented

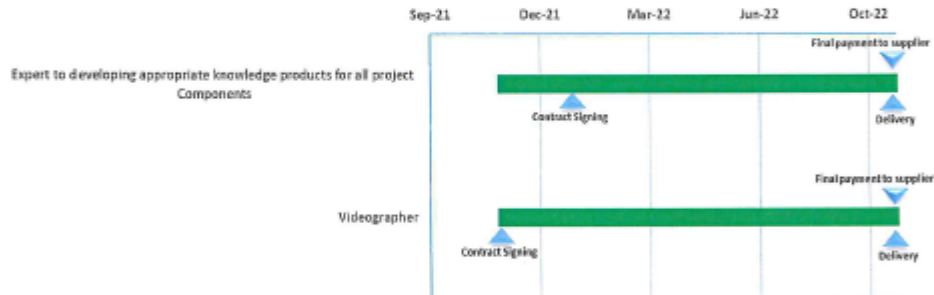
All activities under this output have been completed with the exception of the following:

1. Consultant to conduct regular policy advocacy activities and organize a national forum

Output 4.2: Implementation Schedule & Milestones**Output 4.3 Knowledge management system established**

The main activities under this output include the following:

2. Expert to developing appropriate knowledge products for all project Components
3. Videographer

Output 4.3: Implementation Schedule & Milestones

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Annex 3: Request for Extension of project completion date



Request for extension of project/programme completion date

AF Project / programme ID: GRANT NO. C-AF-I-LB			
Project / programme:		Climate Smart Agriculture: Enhancing Adaptive Capacity of the Rural Communities in Lebanon (AgriCAL)	
Country:		Lebanon	
Project/Programme Approval		21-Nov 2013	
Expected Project/programme Completion		21 April 2022	Proposed Revised Completion 21 October 2023

Reasons/justifications for the extension of project/programme completion

The AgriCAL project faced a lengthy delay in starting up due to delayed establishment of new fund management procedures in Lebanon, as explained in the first extension request. The agreement was signed in November 2013, but inception activities started only in March 2017, with the establishment of the Project Coordination Unit (PCU).

In order to implement foreseen activities through an accelerated work plan, the Government of Lebanon and IFAD submitted a request for a 36 months extension in September 2017.

As per the Adaptation Fund rules, extensions of up to 18 months (renewable) can be considered. Therefore, a first extension of 17 months was granted until April 2019 (Intersessional Decision B.30-31_6). The second 18-month extension was approved in March 2019 (up to October 2020) (Intersessional Decision B.32-33/18).

However, in spite of timely action by IFAD to inform the Government of the approval of the 2nd extension, the project remained completely stalled during the period April - October 2019, as in order for any funds to be committed, the project still required that an "extension

decree" be approved by the Council of Ministers, which happened only in October 2019, because of the absence of an effective government.

Recently Lebanon has been facing a deceleration of its economic activity as a result of multiple factors: public debts and insufficient tax revenue, the 2011-Syrian crisis, banking sector deficiencies since October 2019, and of course the COVID-19 pandemic. This caused a severe economic downturn due to the growing number of infected persons, the exhausted national sanitary and health system and the lockdown measures. All these circumstances constitute a case of force majeure, aggravating delays in the implementation of AgriCAL activities. A third 18-month extension was approved in September 2020 (up to April 2022) (Intersessional Decision B.35.a-35.b/42).

The most recent and most serious issue faced by the project was its inability to access the funds in its Designated Account. This was due to the fact that as a result of the economic crisis that the country is facing, the Banque Du Liban (BdL) prohibited all government projects from disbursing what is known as "Fresh Money". This meant that if AgriCAL wanted to pay its vendors, it will have to pay using "Not-Fresh Money" which in turn means that the vendors will only receive payment in local currency (LBP).

The Ministry of Agriculture, the IFAD country team, and the AgriCAL PCU held a meeting with BdL and the Ministry of Finance on the 17th of March 2021 to find a solution for this issue. An agreement with BdL was reached in which the money in the AgriCAL Designated Account was considered as "Fresh Money" to enable payment for Civil Works and Goods. This agreement by BdL was the first of its kind for any donor-funded project in the country.

Based on the letters received on the 13th of December 2021 from the NDA and Ministry of Agriculture, the current request proposes to extend the project by an additional 18 months – until 21st of October 2023. This request is compliant with Adaptation Fund rules for extension: it has a strong rationale, no additional funds are required and the scope of the project has not changed.

Progress to date and the Accelerated Action Plan

The AgriCAL project team has been very active in the past year to start the ground work for an accelerated implementation. Main activities undertaken are summarized below.

Component One: Water Management

This component showed significant progress in the implementation of the work.

- The supply and installation of an irrigation network for the two hill lakes (Medwe and Nahle) were funded by WFP and the implementation was done completely. A formal document was received from WFP acknowledging consulting the studies by AgriCAL for the development of the irrigation networks.
- Ten contracts related to the supply and the installation for the remaining hill lakes were signed in June 2021 to be implemented by November 2021 from the start date. Two of them were implemented completely and more than 90% of the works were done for the remaining eight networks (See below detailed Table 1).
- Three additional contracts were signed on November 9, 2021, to implement the filtration rooms of the irrigation networks.
- The Contract for the supply and installation of the greenhouse rainwater harvesting system in Rihane and Bentaël was signed in July 2021. Works were completed and accepted by MoE on 30 of November 2021.

Table 1: Progress of Water Efficient Systems

Contract Name	% of completed works
Supply and Installation of Irrigation network for Belt Lf hill lake	94%
Supply and Installation of Irrigation network for Deir El Mokhaless hill lake	91%
Supply and Installation of Irrigation network for Kfarchouba hill lake	97%
Supply and Installation of Irrigation network for Qomayel hill lake	93%
Supply and Installation of Irrigation network for Ehmej hill lake	100%
Supply and Installation of Irrigation network for Menjez hill lake	94%
Supply and Installation of Irrigation network for Ain Bnayeh hill lake	100%
Supply and Installation of Irrigation network for Barqa hill lake	93%
Supply and Installation of Irrigation network for Kalkab hill lake	93%
Supply and Installation of Irrigation network for Zrazir hill lake	96%

Component two: Adaptation Techniques Roll-out

- The contract was signed for the purchase of equipment for LARI's training center on October 4, 2021, and the equipment were delivered on November 9, 2021.
- The contract was signed for the purchase of multifunctional printers for LARI in July 2021 and delivery occurred in September 2021.
- IFAD gave a No Objection for direct selection for the procurement and the installation of 3 weather stations and early warning system on October 27, 2021, with Debbane a local company. The contract was signed on 26/11/2021 and delivery is expected in Q1 2022.
- The contract was signed for the procurement and the installation of drip lines and flow meters as well as pesticides and fertilizer for LARI on October 4, 2021, and the estimated delivery date is January 2022.
- The contract was signed for the trainer in greenhouse, hydroponic and soil-less agriculture on October 17 and trainings are expected to take place in Q1 of 2022
- The procurement process for the purchase of insect pheromone traps was relaunched, the bid opening was done on November 1, 2021. The activity is in the evaluation process.
- The Procurement Process for the statistics and research design trainer expert was relaunched after the withdrawal of the expert who was previously selected due to his commitment to another project, the selection committee is negotiating with the newly selected candidate. The proposal of the consultant was received on November 24, 2021.
- The Training on "Crop Water Requirement: Evapotranspiration" was held online from 5 to 8 October for 4 days, a total of 35 persons from LARI, MoA, and Universities have participated in the training from which 25 persons are women.
- The Training on "Irrigation and crop modeler" was delivered by LARI expert in October 2021, during 3 days, a total of 10 persons from LARI, MoA, and Universities have participated in the training of which 7 persons are women.
- Two of the planned guidelines, on soil-borne diseases and rainfed agriculture adaptation to climate change are finished, and the others are in progress.
- The procurement process to select an expert in the preparation of technical guidelines on crop rotation was launched, the selection committee request to re-launch another time procurement process after finding that the candidates were not qualified to do the consultancy. The consultancy was re-launched on November 19, 2021, and the deadline for submission was December 7, 2021

- LARI team started working on a pilot site for the fodder species assessment.
- The procurement process for the purchase of miscellaneous products for LARI laboratory uses was launched on November 1st 2021. The evaluation committee is preparing the evaluation report
- The purchase and installation of a server and the needed equipment for LARI will be launched in Q1 2022.

Component Three: Rangeland Management

- The contract was signed with the participatory approach expert on June 2021 and the estimated duration of the assignment is until January 2022. The COVID measures and the fuel scarcity delay the submission of the first report of the participatory approach expert. The acceptance committee is reviewing the draft report.
- The contract with the supplier of feed (that will be used through the pasture restoration phase) was signed on November 15, 2021. The quantity of the concentrated feed for sheep and goats increased to 384 T, due to the inability to put feed in the ministry's centers in the Nabatiyeh area, the project was obliged, after IFAD and supplier approvals, to extend the delivery date from 2 months to 4 months after contract signature.
- The project is currently preparing training on animal husbandry, dairy processing for women, and beekeeping. Simultaneously, the project finished the preparation process for the procurement of fences for improved rangeland management and in the preparation phase for the documents related to the procurement of equipment for dairy processing and beekeeping equipment, vaccination campaign, and medicinal plants activity.
- The RFQ concerning the purchase of drinking troughs is prepared, due to the economic conditions and the financial situation delays occurred. The potential bidders require advance payment. In these difficult conditions, the submission of a bank guarantee in Fresh dollars against this payment is difficult to ensure. The project is trying to find solutions to the prepayment process.
- The ToR for the consultant who will do the training for the local communities and DRDNR staff on the implementation and monitoring of the rangeland management plans is in process.
- The procurement and the installation of fences are in the final phase .
- The procurement of equipment for dairy processing is in the technical specification phase.

- The Technical specifications for the purchase of aromatic and medicinal plants are prepared.
- The vaccination campaign for the herds is within the preparation phases.
- The material for the training on animal husbandry good practices is in the preparation phase.
- The material for the training of women on dairy processing is in the preparation phase.
- The contract was signed for the rehabilitation of MoA nursery (for trees, pastoral shrubs and aromatic & medicinal plants) in Abdeh in July 2021, and the delivery date is January 12, 2022.

Component Four: Climate index-based insurance, Policy and Knowledge management

- The Project team is preparing the ToR for the Consultant to conduct advocacy policy. No objection was received on November 21, 2021. It will be launched in Q1 2022.
- The Contract with the videographer was signed on November 9, 2021. The Consultant started the shooting immediately and has already produced two high quality videos.
- The procurement of expert to develop appropriate knowledge products was launched on November 4, 2021.

Annex I Letter of Minister of Agriculture requesting extension of AgriCal


Annex II Letter of Minister of Environment (NDA) requesting extension of AgriCal

Annex III Progress Report until November 2021.

Annex IV: List of outputs planned and implementation schedule until end of requested extension period.

Implementing Entity certification

This request has been prepared in accordance with Adaptation Fund policies and procedures, has been agreed by participating executing entities, and the designated authority (DA) has been notified.

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Annex 4: Material Change and project revisions justification note

AgriCAL Proposed Changes.

Project Full Title: Climate Smart Agriculture: Enhancing Adaptive Capacity of the Rural Communities in Lebanon (AgriCAL)

Project Code: LBN/MIE/Agri/2012/1

Approval: 18th Meeting of the Adaptation Fund Board (June 2012)

Background.

1. The AgriCAL project has over the years experienced a number of challenges and setbacks that have adversely impacted the rate of implementation of the project. As reported in the 2020 PPR, the project has historically experienced significant delays caused by a number of critical risks external to the project. The primary cause has been one of a lack of government as well as slow and inefficient governmental decision-making processes; internal political wrangles have meant prolonged time periods without a recognised government to approve project documents, budgets and work plans. The project start-up was hampered by delays in the preparation of a Decree required to authorise the transfer of funds from the Ministry of Finance to AgriCAL's designated account and subsequently also an unfortunate sequence of mistakes and misunderstandings within the government that prolonged the delays. Frequent changes of governments have also resulted in the changing of the Ministers of Agriculture and Finance that usually also result in delays in signing and approving all documents and transactions related to the project. During periods of no elected government it was common for additional delays that were frequently caused by decisions needing to be made by multiple ministers, at times up to 24.
2. Compounding this unfavourable environment have been persistent adverse macro-economic factors such as high inflation rates, the depreciation of the Lebanese Pound against major international currencies, high debt to GDP (Gross Domestic Product) ratio and insecurity caused by both internal and external factors that have all combined to contribute to the significant delays experienced by the project. In 2019 Lebanon experienced a financial collapse and has since been grappling with a deep economic crisis after successive governments piled up debt following the 1975-1990 civil war. The country has a debt to output ratio of 150%, it has a currency that is in freefall having lost around 85% of its value against the US dollar, and according to some reports national banks owe around USD 90 billion. As a consequence in late 2019 the government severely restricted withdrawals and foreign transfers, especially US dollars and this had the effect of grinding the project implementation to a halt.

Financial flow and IFAD support

3. The Ministry of Agriculture, the IFAD country team, and the AgriCAL PCU held a meeting with BdL and the Ministry of Finance on the 17th of March 2021 to find a solution for this issue. An agreement with BdL was reached in which the money in the AgriCAL Designated Account will be considered as "Fresh Money" to enable payment for Civil Works and Goods. Other activities such as consultancies and Project Implementation Costs (PEC) will be paid with "None-Fresh Money" and this is acceptable and implementable. This agreement by BdL was the first of its kind for any donor-funded project in the country.
4. With this agreement, the AgriCAL project showed significant accelerated progress where contracts valued at USD 1.3 million signed and physical progress in the 10 hill lakes and Abdeh Nursery is almost 100% in a very short period of 6 months. The project's ability to achieve such significant progress in 6 months illustrates that the fundamental issues that previously hindered implementation have been resolved and should no longer affect the project in the coming period. It is expected that the project will disburse approximately USD 2.5 million from June 2021 to April 2022 (i.e. 35% of total funding in 10 months).

Project Changes

5. Despite the challenges, there are positive signs that project implementation is starting to take place. However, 9 years since project approval (2012 – 2021) there are a number of amendments needed to ensure that the project activities remain relevant to the current context. The changes are not due to changing the overall objective of the project but instead changing activities to better meet that overall objective considering today's situation. From a budget perspective, the main change regards the overall indicator for Outcome 1 the project proposes to increase the supplementary water available from 75,000m³ to 406,800 m³. This will be achieved as described below.

Output 1.1: Rainwater harvested from greenhouse rooftops (original budget USD 662,500; revised budget, USD 106,000 – 8.49% - not material change² but change in target from 135,5 ha to 0,5 ha – material change)

6. The changes requested in this output do not constitute a material change as the reduction of USD 556,500 from USD 662,500 to USD 106,000, equals 8.5% of project costs. The amendment however will require a change in the indicator targets as per the original results framework (see below). The original project design envisioned that 135, 5ha farms receive new Single Span Greenhouses (SSG) with 25,000 m³ of water stored for irrigation. The proposed change will reduce the number of farms to two demonstrations (0.5ha) for a water saving of 800m³. The SSG was originally recommended worldwide for the advantages it has compared to the arched tunnel greenhouse, especially regarding the Integrated Production and Protection (IPP) and Integrated Pest Management (IPM). However in assessing the potential for greenhouses for rainwater harvesting, the project has found out that in the target area (Qasmiyeh plain), most if not all the beneficiaries already own SSG as well as the cheaper Arched Tunnel Greenhouses (ATG). The Ministry of Environment (MoE) consequently requested that the project not provide greenhouses to beneficiaries that already own them and instead conduct two greenhouse demonstrations with rooftop water harvesting to the farmers in the surrounding Byblos area to demonstrate the benefits of the technology. The proposed demonstrations will aim to cover both SSG and ATG greenhouses although due to the current economic situation it is expected that most farmers will opt for the ATG because it is much cheaper than the SSG. The MoE prefers to keep both options open for the farmers in order not to put additional financial pressure on them. Nevertheless, the benefits of the SSG will be strongly highlighted and recommended to those who can afford them. The amended output will still have a focus on climate change adaptation as the demos will be targeted at the coastal areas and mid-altitude highlands that are suffering from water scarcity and over exploitation of the water table.

Output 1.2: Rainwater harvested from roads (original budget USD 538,300; revised budget: activity cancelled)

7. In output 1.2 it was originally planned for the project to introduce water harvesting along the roads constructed by the Green Plan with the objective to supply 120, 10ha farms with 50,000m³ of harvested rainwater. As part of the planned assessment as per the project document activities, it was however realised that the target area does not have a suitable location for collecting the harvested water. The Green Plan team searched and investigated over all the executed roads by the department of road and water without finding a suitable site or location close to the roads where a hill lake or large tanks can be built to store the harvested water within servicing distance of potential beneficiaries. The activity was deemed to be not economically feasible and is proposed to be cancelled in favour of the former output 1.3, now 1.2 below.

Revised output 1.2 Improved access to climate-resilient water & Water efficient irrigation systems deployed (former 1.3 Water efficient irrigation systems deployed) Original budget: 426,000; revised budget, USD 1,814,000 – 21.17- material change.

8. At project design, the aim was to increase water availability for 150ha of farmland that were to be supplied with water for climate-resilient irrigation from the water harvesting Hill Lakes developed under the IFAD

² Material change is defined as “any cumulative total budget change at output-level between the revised budget and the original budget that involves ten per cent (10%) or more of the total budget of the project/programme (excluding project fees)”. Link: [Readiness-NIE-seminar_Martina.pdf \(adaptation-fund.org\)](#)

project Hilly Areas Sustainable Agriculture Development Project (HASAD). AgriCAL was meant to have promoted different technologies including the possibility to improve the efficient use of water through the deployment of water-efficient irrigation systems, to shift irrigation practices from surface to drip irrigation. In 2019 the HASAD project was completed and 12 hill lakes were established with a capacity to collect 479,000 m³ of rainwater. While HASAD constructed the 12 hill lakes, the project was only partly successful as the hill lakes have not been connected to the main irrigation networks as planned. Accordingly, in addition to providing efficient irrigation systems, the proposed changes by the project would be to ensure access by the AgriCAL beneficiaries to the water available in the Hill Lakes developed under the HASAD project. To achieve this it is proposed that AgriCAL would construct 27.1km of irrigation network for 10 of these hill lakes in order for the water to reach the farmers living in the surrounding areas, While taking into consideration that the remaining two networks have been successfully constructed by the World Food Programme (WFP) in early 2021. As a result of the output revision, AgriCAL will ensure that 262 hectares, comprising 698 farms, will be made climate-resilient. The Hill Lakes, volume of water and length of network to be constructed by AgriCAL and WFP are shown in table 1 below. The addition of the construction of the primary networks of the 10 hill lakes by AgriCAL increased the output budget from USD 426,000 to USD 1,814,000. To address sustainability concerns around the water networks, the Green Plan will provide institutional capacity development including technical capacity building and support to the water committees and Water User Associations (WUAs). The project will also cooperate with relevant municipalities and WUAs to agree on the fee to be charged to the beneficiaries for the provision of the irrigation service to ensure proper operation and maintenance of the networks. This will ensure the sustainability of this sub-component. The Hill Lakes, volume of water and length of network to be constructed by AgriCAL and WFP are shown in table 1 below.

Table 1 Capacity (m³) for the 10 Hill Lakes and Length (km) of Each Irrigation Network

#	Hill Lake name	Volume (m ³)	Length of network (km)
AF / AgriCAL			
1.	Ehmej	30,000	2.4
2.	Beit Lif	28,000	1.8
3.	Ain Bnayeh	30,000	1.5
4.	Menjez	46,000	3.9
5.	Kfarchouba	45,000	2.7
6.	Barqua	40,000	2.97
7.	Zrazir	45,000	4.2
8.	Kernayel	20,000	1.5
9.	Deir El Mkhalles	55,000	3.5
10.	Kaïkab	67,000	2.63
Total AgriCAL		406,000	27.1
World Food Programme (WFP)			
11	Nahle	20,000	3.45
12	Medwe	53,000	2.35
Total WFP		73,000	5.8
Grand Total		479,000	32.9

Output 2.1: Enhanced early warning system to farmers through improved existing system
original budget: 190,000; revised budget, USD 375,000 – 2.82%- not material change, but material change in target from 2 weather stations to 12 weather stations

9. The early warning system based at LARI relies on the 60 deployed weather stations into different parts over the country. The original design envisaged that additional weather stations are needed to complete the coverage of the project area as follows: Baalbeck-Hermel: 3 stations; Akkar: 1; and Southern Litani: 3 stations. However, LARI's current assessment revealed that more stations are needed in the project area as follows: Naqoura: 1 station; Tebnine; 1 station; MarjAyoune: 1 station; Damour: 1 station; Beskinta: 1 station; Bikfaya: 1 station; Qartaba: 1 station; Bentaël: 1 station; Batroun: 1 station; 1 Aarsal: 1 station; Yamoune: 1 station; Chaat: 1 station. Taking this into consideration the output budget was increased from USD 190,000 to USD 375,000.

Output 2.2: Expanded farmer outreach and ensured financial and management sustainability of the warning system (original budget: USD 100,000; revised budget, USD 25,000 – 1.14%- not material change, but material change in target from 20,000 beneficiaries to 60,000 beneficiaries)

10. This output will ensure the sustainability of the service through proposing the most appropriate financial mechanism to the warning system. It involves different parties including public and private sector actors. The financial sustainability of the system will enable up-scaling it to all farmers nationwide. The AgriCAL project was successful in driving a Public Private Partnership (PPP) between LARI and Debbane Company which is the local agent of Pessl, the manufacturer of the weather stations currently used by LARI all over the country. Debbane will provide LARI with Agrometeorological services at a fraction of the cost for 5 years in return for advertising rights in the EWS smartphone application. This agreement will ensure sustainability of the EWS for at least the coming 5 year, if not longer, in the event of the renewal of the agreement by both parties. The success of the PPP reduced the cost of this output from USD 100,000 to USD 25,000. The USD 25,000 is dedicated to a consultant who will develop a comprehensive private sector strategy that will ensure sustainability and further partnership with other interested private sector entities. To date LARI has 49,000 farmers registered on their website to receive early warnings through SMS. The AgriCAL project will enhance this service through developing a mobile app that is user friendly, will provide more comprehensive warnings, and access to metrological data. LARI expects an increase in EWS users by at least 11,000 until project end a direct results of the mobile app.

Output 2.3: Capacity building on adaptation techniques for vulnerable field crops enhanced (original budget: USD 250,000; revised budget, USD 180,000 – 1.07%- not material change, but material change in number of targeted sites from 3 to 2)

11. The original design tTargeted areas are those producing cereals and legumes: namely Bekaa, Marjayoun and Akkar regions. The adoption of adaptation techniques simultaneously will have a positive impact on the reduction of energy for plowing and spraying, and consequently enhance mitigation by reducing CO2 emissions. The approach of demonstration plots for MOA and NGOs technicians, as well as farmers will be the most appropriate tool to promote the up-scaling of the use of these technologies for cereal and legume growers. Both Bekaa and Akkar are still targeted by the project while Marjayoun was excluded at start of implementation. This is due to the fact that it would need more than 20 weather stations in place in order for implementation to commence. The fact that this number of stations does not exist in the area makes it impossible to implement the activities under this output. The exclusion of Marjayoun reduced the output budget from USD 250,000 to USD 180,000.

Output 2.4: Guidelines and recommendations on agricultural adaptation techniques for vulnerable areas developed (original budget: USD 400,000; revised budget, USD 67,000 – 5.08%- not material change, but the sum of the outcome negative and positive percentages indicate material change)

12. The original design envisaged that external experts will be needed to develop these guidelines. However, LARI experts took the lead on developing these guidelines which reduced the cost significantly, taking into consideration that the majority of them are already receiving incentives for their work on other related outputs of this component. This proposed implementation modality reduced the output budget from USD 400,000 to USD 67,000.

Output 2.5: National fodder resource assessment prepared (original budget: USD 860,000; revised budget, USD 365,800 – 7.54%- not material change, but the sum of the outcome negative and positive percentages indicate material change)

13. This output is conducted in Mount Lebanon, Anti-Lebanon, and the whole Bakka valley including the Nabatia region. These areas fully represent the 4 habitat zones of rangelands in Lebanon allowing the assessment to be generalized nationally. Since the time of the original design LARI and MOA have been able to develop their internal capacity to fully conduct this assessment. LARI and MOA experts will be contracted to conduct the assessment at a lower cost than the originally estimated cost. Laboratory and field equipment necessary to conduct the assessment will also be procured for LARI by AgriCAL, this modification will ensure that the original output is implemented, in addition to the added value of building the capacity of local institutions (i.e. LARI). Through this arrangement the output budget is reduced from USD 860,000 to USD 365,800.

Output 3.1: Community-based sustainable rangeland management plan prepared (original budget: USD 580,000; revised budget, USD 776,800 – 2.99%- not material change, but the sum of the outcome negative and positive percentages indicate material change)

14. A thorough assessment by the MoA revealed that the targeted area needs to be limited due to the fact that the beneficiaries will require various types of support in order to achieve the objective of this output. Firstly, the optimal areas to implement this output were determined to be Nabatia and Balabak because they are the only two areas where no studies were conducted in before. The study and management plan will be conducted for both areas, however, it will only be implemented in Nabatia because costs of the needed support have increased substantially since the design of the project. Furthermore, the field assessment indicated that in order for the rangelands to recover, beneficiaries must stop grazing for at least one season. Accordingly, considerable fodder amounts will be provided to the beneficiaries in order to stop grazing for the required period of time. Other alternative income-generating support such as bee keeping and aromatic herbs is also needed to support the beneficiaries through the period of non-grazing. Quality enhancement of dairy production is also necessary for achieving the objective of this output as was initially envisaged by the original design. Therefore different types of trainings and equipment will be provided for beneficiaries to improve the quality of their production. Taking all of the above into consideration, this output budget needed to be increased from USD 580,000 to USD 776,000.

Output 3.2: Restored degraded rangeland areas and reduced flood risks (original budget: 1,970,000; revised budget, USD 2,691,000 – 11.00%- material change and material change in target from 166 km of flood control intervention to 366 km)

15. The original project design aimed to focus on the rehabilitation of two watersheds (in Faara and Nahle) covering 166 km² with the aim to reduce the impact of floods, restore the vegetation of the degraded upper water-catchments to facilitate increased water infiltration and reduce surface runoff. This would then buffer the adverse effects of climate extremes and enhance coping of the rangeland ecosystem to climate change. The original aim over the course of 3 years on at least 2300ha in 2 watersheds (2000ha restored with fodder species and 300ha with forest species) of degraded rangelands in the selected pilot area will reduce further deterioration of vegetation cover and prevent erosion.
16. However, the MoA advised the project that the most urgent and most substantial need is in flood reduction. The MoA also committed to implementing the plantation upon completion of the flood control measures/structures. The MoA also advised that the inclusion of Al-Qaa water shed was necessary since it became increasingly more dangerous, in addition to the fact that based Nahle has already been

constructed by the MoA. Moreover, the inclusion of Al-Qaa increased the project's total coverage of the flood control intervention from 166 km to 366 km.

17. The original design of the project targeted Deir el Ahmar and Kfar Dan nurseries, however the MoA has already rehabilitated both sites. For this reason, the MoA recommended that the project rehabilitate the Abdeh nursery which will produce more than four times of seedlings compared to the previously targeted two nurseries. The proposed increase of the flood control area, by more than double, resulted in the increase of the out budget from USD 1,970,000 to USD 2,691,000.

Output 4.1 Climate index-based insurance initiated – cancelled)

18. Output 4.1 of the original project document included the piloting of a climate index-based insurance however during the initial assessment, the feasibility of the activity was questioned for a number of reasons. Primarily that the required meteorological infrastructure on the farmers lands do not currently exist which makes the piloting of the climate-based insurance not feasible. Additionally historical meteorological data is not available on selected crops within the same region to assess weather patterns and impact for comparative purposes. Ultimately it was also assessed that insurance companies would need to be willing to engage with and insure farmers, which was not the case. Despite the Ministry of Agriculture having made a number of unsuccessful attempts to develop such an insurance pilot upon request of AgriCAL, in absence of the required preconditions it is recommended that this activity be cancelled.

Output 4.2 (former 4.3) Knowledge management system established and knowledge management activities implemented (– indicator change.)

19. This output originally focused on establishing the knowledge management system and ensuring that all the requirements for its effective functioning are put in place. Part of the identified outputs in the results framework was that by year four at least 8 policy briefs were to be identified. Upon review the project is only able to identify 4 policy briefs. The project is therefore requesting to amend the output indicator accordingly.

Project Execution Cost (PEC):

20. There are minor but necessary changes to the PEC mainly in regards to the addition of two procurement officers who were not envisaged in the original design, but are absolutely necessary for successful implementation of the project. Additionally, some other costs as indicated in annex 3 were also increased as a result of inflation which is calculated at around 78% from 2012 until 2020³. Nonetheless, the overall PEC was maintained at 9.5% of total budget by moving some costs to the EE such as the mid-term and final evaluation.

Project Disbursement Matrix:

21. Project disbursement matrix has been adjusted to accommodate the accelerated implementation plan in the in the proposed extension period. The third disbursement has been increased based on the disbursement plan presented in annex 4 of the modified design document, in addition to taking into account contract advance payments for contracts that will be signed in Q2 2023, but implemented in Q3 and Q4 2023.

Alignment with Adaptation Fund Results Framework

22. In view of the cancelled output 4.1 Climate index-based insurance initiated, the outcome indicators of the project is no longer aligned with the AF outcome 2: 'Strengthened institutional capacity to reduce risks associated with climate- induced socioeconomic and environmental losses' and the related output

³ World Bank, Inflation, consumer prices (annual %) – Lebanon, 2020. Link: <https://data.worldbank.org/indicator/FP.CPI.TOTL.ZG?locations=LB>

2.2.1. 'Percentage of population covered by adequate risk- reduction systems. Consequently these have been removed as reflected in the AF results framework table below.

Annex 1 Revised Results Framework

Output	Indicator	Baseline	Original Target	Revised Targets	Source of Verification	Risks and Assumptions
Component 1: Water Management						
Outcome 1: Increased water availability and efficient use through water harvesting and irrigation technologies	Number of beneficiaries	No supplementary water available from water harvesting in the project focus areas	n.a.	700 beneficiaries + 50 indirect beneficiaries	Mid-term and final evaluations Project progress reports	Political instability might cause effectiveness or implementation delay. Delays in programme implementation, and particularly in the development of infrastructure intervention. Farmers cooperate with the project and provide the land and required contributions.
	Number of km of hill lake primary irrigation networks constricted		n.a.	12 hill lakes 32.9 km of primary irrigation networks		
	Number of hectares served by efficient irrigation systems		150 Hectare	262.5 Hectare		
Output 1.1: Rainwater harvested from greenhouse roof tops	Quantity (m ³) of supplementary water available for agriculture as a result of water harvesting and the use of efficient irrigation systems		By year 4, 75,000 m ³ of supplementary water available for agriculture in the project focus areas	By end of project, at least 479,800m ³ of supplementary water available for agriculture in the project focus areas		
	Number of farms/hectares using the SSG Number of greenhouse demonstrations	Zero hectares out of 1000 ha approx.	135 Farms/5 Hectares	2 demonstrations / 0.5 ha 2 beneficiaries + 50 indirect beneficiaries	Green Plan field reports Procurement reports	
	Quantity of stored water for supplementary irrigation	Zero m ³	25,000 m ³	800 m ³		

Output	Indicator	Baseline	Original Target	Revised Targets	Source of Verification	Risks and Assumptions
Output 1.2:- Rainwater harvested- from agriculture- roads	Number of farms/hectares- using the water supply for- supplementary irrigation	Zero hectares	120 Farms/10 Hectares	Cancelled	Green Plan field- reports Procurement- reports	
	Quantity of stored water	Zero m³	50,000 m³			
Output 1.2: Water- efficient irrigation- systems Deployed Output 1.2 Improved access to climate- resilient water & Water efficient irrigation systems deployed	Number of Beneficiaries	15,000 ha all over the country. Data in focus area not available.	n.a.	698 beneficiaries	Green Plan field reports Procurement reports	
	Number of km of hill lake primary irrigation networks constructed		n.a.	12 hill lakes 32.9 km of primary irrigation networks		
	Number of hectares served by efficient irrigation systems-with access to climate-resilient water source		150 ha	262 Hectares		
	Quantity of water supplied to farms m3		By year 4, 75,000 m3 of supplementary water available for agriculture in the project focus areas	At least 400,000 m³		

Output	Indicator	Baseline	Original Target	Revised Targets	Source of Verification	Risks and Assumptions
Component 2: Adaptation Techniques Roll-out						
Outcome 2: Increased adaptation to climate change for crop production	Change in food security in the programme area as a result of using climate-resilient agricultural and livestock production methods, measured as increase in quantity of local production or income Number of beneficiaries		By year 4, 25% increase in crop and livestock production or in income in the focus areas 20,335 beneficiaries	By end of project, 25% increase in crop and livestock production or in income in the focus areas compared to individual baselines 60,235 beneficiaries	Mid-term and final evaluations Project progress reports Livelihood surveys Agriculture observatory annual production survey	<p>Low human and institutional capacity for the implementation of climate change related interventions, especially at the local level.</p> <p>Project capable of mobilizing partners to contribute to the financial sustainability of the warning system.</p> <p>Farmers perceive the benefits of acting to the early warning system recommendations, and expand its use.</p>
Output 2.1: Enhanced early warning system to farmers through improved existing system	Number of meteorological stations installed in the project focus areas	60 weather stations	2 additional weather stations	12 additional weather stations	LARI weather reports	
	Number of staff trained on meteorological observation and analysis	4 staff	15 staff	15 staff	Training reports and evaluations	
	Frequency of production of improved climate risk information (for pest outbreak prediction, water demand, etc)	Not available	Daily	Daily	LARI weather reports Farmers' satisfaction survey	
Output 2.2: Expanded farmer outreach and ensured financial and management sustainability of the warning system	Number of farmers receiving climate risk information	49,000 farmers	20,000 farmers	60,000 farmers	LARI weather reports Farmers' satisfaction survey	
	Financial flow to sustain the system	Zero %	50% of the system's cost covered by non-core budget	50% of the system's cost covered by non-core budget	LARI financial reports	

Output	Indicator	Baseline	Original Target	Revised Targets	Source of Verification	Risks and Assumptions
Output 2.3: Capacity building on adaptation techniques for vulnerable field crops enhanced	Number of project beneficiaries trained on agricultural adaptation measures disaggregated according to gender	None	At least 300 farmers	At least 200 farmers (30% women)	Training reports and evaluations	
	Number of professionals trained to enable rolling out of climate- resilient agricultural production technologies and methods	None	20 professionals	20 professionals	Training reports and evaluations	
Output 2.4 Guidelines and recommendations on agricultural adaptation techniques for vulnerable areas developed	Agricultural adaptation techniques for vulnerable areas identified	None	5000 copies of the guidelines (on different techniques) published and disseminated on websites and networks	5000 copies of the guidelines (on different techniques) published and disseminated on websites and networks	Published guidelines Project website	
Output 2.5: National fodder resource (NFRA) assessment prepared	List of fodder species, their distribution and nutritional value prepared The carrying capacity of the rangelands in the sampled areas calculated	Non existent	Nationwide assessment completed	Assessment conducted in Bekaa North (Road Hadath baalbeck – Afca) and Terbol to Anjar.	Published NFRA study	
Component 3: Rangeland Management						

Output	Indicator	Baseline	Original Target	Revised Targets	Source of Verification	Risks and Assumptions
Outcome 3: Increased resilience of shepherds and small ruminants to climate change through sustainable rangeland management	Increased productivity of the rangelands in the focus areas measured by increase in income of locally produced meat and quantity of dairy products Number of beneficiaries		increase in income and milk productivity by year 4 of the project 220	increase in income and milk productivity by end of the project 12,420 beneficiaries + 35,450 indirect beneficiaries	Mid term and final evaluations Project progress reports Milk production monitoring by MoA	Lack of incentives for particular local communities to cooperate in activities that do not yield immediate financial value, but aim at longer- term resilience, may reduce stakeholder engagement and comprehensive participation
Output 3.1: Pilot sustainable rangeland management plan implemented	Management plan prepared and adopted	Non existent	One management plan	Two management plans	Published management plan	
	National guidelines prepared and adopted	Old obsolete guidelines not based on scientific results	Adopted national guidelines	Adopted national guidelines	Published national guidelines MOA Decisions	
	Number of professionals trained on sustainable rangeland management	None	20 professionals	20 professionals	Training reports and evaluations	
	Number of households trained and participating in rangeland management and dairy product processing disaggregated according to gender	None	200 households	200 households (30% Women) + 450 indirect households	Field surveys	

Output	Indicator	Baseline	Original Target	Revised Targets	Source of Verification	Risks and Assumptions
Output 3.2 Restored degraded rangeland areas and reduced flood risks	Number of beneficiaries	None	n.a	12,200 households + 35,450 indirect beneficiaries	Field survey MOA reports	
	Number of nurseries rehabilitated	One in the focus areas	2 nurseries	1 nursery		
	Number of seedlings produced	Zero	125,000 seedling/year	500,000 seedling/year		
	Area covered by flood risk reduction measures	2 watersheds managed out of 14	166km (2 additional watersheds)	366km (2 additional watersheds)		
Component 4: Climate index-based insurance, Policy and Knowledge Management						
Outcome 4: Climate index-based insurance initiated , Policy influenced and lessons learned and shared through a knowledge management system	Amount of compensation funds disbursed to affected farmers	Not existent	At least 50% of farmers' losses due to climate change compensated for through the climate index insurance scheme	Cancelled	Mid-term and final evaluations Project progress reports	National stakeholders cooperate and agree on designing and implementing the climate index insurance scheme Changes in the government structures and functions of the implementing partners
	Level of increase in awareness about climate change among decision makers and farmers (gender disaggregated)		At least 60% of targeted decision makers and farmers show increase in the level of awareness	At least 60% of targeted decision makers and farmers show increase in the level of awareness	Mid-term and final evaluations Project progress reports	Decision and policy-makers at all levels are slow to appreciate the need to mainstream climate change

Output	Indicator	Baseline	Original Target	Revised Targets	Source of Verification	Risks and Assumptions
Output 4.1:- Climate index-based insurance initiated	Climate index adopted	None	By year 2, 1 climate index	Cancelled	Project reports- LARI weather reports	considerations into activities and investments
	One index piloted	None	One focus area or one crop			
Output 4.1: Policy advocacy activities implemented	Number of policies/plans/ strategies revised or developed as a result of policy advocacy activities	None	By year 4, at least 3 policies/plans/ strategies	By end of project, at least 3 policies/plans/ strategies	Published policies/plans/ strategies Governmental decisions and decrees	
Output 4.2: Knowledge management system established and knowledge management activities implemented	Number of knowledge products developed for use in policy advocacy activities	None	By year 4, at least 8 policy briefs	By project end at least 4 policy briefs	Policy Briefs	
	Number of lessons learned and best practices up taken in the project outreach strategy		Every year of project implementation, at least 8 lessons learned and best practices consolidated in Experience	Every year of project implementation, at least 8 lessons learned and best practices consolidated in Experience	Experience Notes	

Output	Indicator	Baseline	Original Target	Revised Targets	Source of Verification	Risks and Assumptions
	Number of relevant networks or communities through which lessons learned are disseminated		Notes disseminated through website and other media Project outputs disseminated through at least two networks	Notes disseminated through website and other media Project outputs disseminated through at least two networks	Project website Project inputs to networks	

Annex 2 AF Results Framework

Project Objective(s)	Project Objective Indicator(s)	Fund Outcome	Fund Outcome Indicator
To support the implementation of climate change adaptation measures in the agriculture sector in three highly vulnerable focus areas.	<u># of poor smallholder households whose livelihoods from agriculture has been increased because of AgriCAL, disaggregated by sex</u>	Outcome 2: Strengthened institutional capacity to reduce risks associated with climate-induced socioeconomic and environmental losses	2.2. Number of people with reduced risk to extreme weather events
		Outcome 4: Increased adaptive capacity within relevant development and natural resource sectors	4.1. Development sectors' services responsive to evolving needs from changing and variable climate
		Outcome 5: Increased ecosystem resilience in response to climate change and variability-induced stress	5. Ecosystem services and natural assets maintained or improved under climate change and variability-induced stress
		Outcome 7: Improved policies and regulations that promote and enforce resilience measures	7. Climate change priorities are integrated into national development strategy
Project Outcome(s)	Project Outcome Indicator(s)	Fund Output	Fund Output Indicator
1. Increased water availability and efficient use through water harvesting and irrigation technologies Improved access to climate-resilient water	Quantity (m ³) of supplementary water available for agriculture as a result of water harvesting and the use of efficient irrigation systems	Output 4: Vulnerable physical, natural, and social assets strengthened in response to climate change impacts, including variability	4.1.2. No. of physical assets strengthened or constructed to withstand conditions resulting from climate variability and change (by asset types)
2. Increased adaptation to climate change for crop production	Change in food security in the programme area as a result of using climate-resilient agricultural and livestock production methods, measured as increase in quantity of local production	Output 5: Vulnerable physical, natural, and social assets strengthened in response to climate change impacts, including variability	5.1. No. and type of natural resource assets created, maintained or improved to withstand conditions resulting from climate variability and change (by type of assets)
3. Increased resilience of shepherds and small ruminants to climate change through sustainable rangeland management	Increased productivity of the rangelands in the focus areas measured by increase in quantity of	Output 5: Vulnerable physical, natural, and social assets strengthened in response to climate change impacts, including variability	5.1. No. and type of natural resource assets created, maintained or improved to withstand conditions

	locally produced meat and dairy products		resulting from climate variability and change (by type of assets)
4. Climate index based insurance-initiated, p Policy influenced and lessons learned and shared through a knowledge management system	Amount of compensation funds-disbursed to affected farmers Level of increase in awareness about climate change among decision makers and farmers	Output 2.2: Targeted population groups covered by adequate risk reduction systems Output 7: Improved integration of climate-resilience strategies into country development plans	2.2.1. Percentage of population-covered by adequate risk-reduction systems 7.1. No., type, and sector of policies introduced or adjusted to address climate change risks

Annex 3 Budget revision

PROJECT COMPONENTS	OUTCOME	EXPECTED CONCRETE OUTPUTS	ORIGINAL AMOUNT (US\$)	REVISED BUDGET (US\$)	Difference	Material Change of project costs
1. Water Management	Outcome 1. Increased water availability and efficient use through water harvesting and irrigation technologies	Output 1.1: Rainwater harvested from greenhouse roof tops	662,500	106,000	-556,500	-8.49%
	Outcome 1. Increased water availability and efficient use through water harvesting and irrigation technologies	Output 1.2: Rainwater harvested from roads	538,300	0.00	-538,300	Cancelled
	Outcome 1 Increased water availability and use through water harvesting technologies	Output 1.2: Water efficient irrigation systems deployed	426,000	1,814,000	1,388,000	21.17%
Component 1 sub-total			1,626,800	1,920,000	293,200	12.68%
2. Adaptation Techniques Roll-out	Outcome 2. Increased adaptation to climate change for crop production	Output 2.1: Enhanced early warning system to farmers through improved existing system	190,000	375,000	185,000	2.82%
		Output 2.2:Expanded farmer outreach and ensured financial and management sustainability of the warning system	100,000	25,000	-75,000	-1.14%
		Output 2.3: Capacity building on adaptation techniques for vulnerable field crops enhanced	250,000	180,000	-70,000	-1.07%
		Output 2.4:Guidelines and recommendations on agricultural adaptation techniques for vulnerable areas developed	400,000	67,000	-333,000	-5.08%
		Output 2.5: National fodder resource	860,000	365,800	-494,200	-7.45%

PROJECT COMPONENTS	OUTCOME	EXPECTED CONCRETE OUTPUTS			ORIGINAL AMOUNT (US\$)	REVISED BUDGET (US\$)	Difference	Material Change of project costs	
		assessment prepared							
Component 2 sub-total					1,800,000	1,012,800		-12.01	
3. Rangeland Management	Outcome 3. Increased resilience of shepherds and small ruminants to climate change through sustainable rangeland management	Output 3.1: Community-based sustainable rangeland management plan prepared			580,000	776,000	196,000	2.99%	
		Output 3.2: Restored degraded rangeland areas and reduced flood risks			1,970,000	2,691,000	721,000	11.00%	
Component 3 sub-total					2,550,000	3,467,000		13.99	
4. Climate index-based insurance, Policy and Knowledge Management	Outcome 4: Climate index-based insurance initiated, Policy influenced and lessons learned and shared through a knowledge management system	Output 4.1 Climate index-based insurance initiated (Cancelled)			580,000	157,000	-423,000	-6.45%	
		Output 4.1 Policy and advocacy activities implemented							
		Output 4.2 Knowledge management system established and knowledge management activities implemented							
Project costs					6,556,800	6,556,800			
Project Execution Costs									
Item		Original Unit Cost (USD)	Revised Unit Cost	Units	Revised Units	Original Total (USD)	Revised Total (USD)	-	-
Office Rent		-	-	-	-	In-kind contribution	In-kind contribution	-	-

PROJECT COMPONENTS	OUTCOME	EXPECTED CONCRETE OUTPUTS			ORIGINAL AMOUNT (US\$)	REVISED BUDGET (US\$)	Difference	Material Change of project costs
Project Coordinator	4,200	1850	48	85	201,600	157,250	-	-
Administrative Officer	1,500	1500	40	41	60,000	30,917	-	-
Monitoring and evaluation and communication Officer	2,200	500	24	42	52,800	17,000	-	-
Account and Finance Officer	-	1,750	-	74	-	65,935	-	-
Procurement Officer (A)	-	1,000	-	67	-	38,450	-	-
Procurement Officer (B)	-	750	-	48	-	16,875	-	-
Technical Expert (Green Plan)	3,000	3048	42	12	126,000	48,176	-	-
Technical Expert (LARI)	3,000	2108	42	12	126,000	26,500	-	-
Technical Expert (MoA)	-	4,104	-	12	-	57,100	-	-
Audit	-	6,500	-	9	-	56,400	-	-
Operating Cost	-	8,000	-	5.5	-	42,888	-	-
Mid-term Evaluation	1	22000	1	cancelled	22,000	Cancelled from PEC, but will be carried out through the IE Cost	-	-
Final Evaluation	1	22000	1	30,000	22,000	Cancelled from PEC, but will be carried out through the IE Cost	-	-
IT equipment	1	44,050	10000	1	10,000	35,028	-	-
Stationary and supplies	250	250	46	14	11,500	8,063	-	-
Travel to project field sites	500	500	46	46	23,000	42,087	-	-
International Travel	2,000	21,000	4	1	8,000	15,777	-	-
Car + insurance and maintenance	25,300	33,580	1	1	25,300	29,955	-	-
5 Total Project Execution cost					688,200	688,200		
6.Total Project/Programme Cost					7,245,000	7,245,000		
IFAD Implementing Fee								
Development and Preparation					123,165	123,165	-	-
Overall Coordination and Management					184,747.5	184,747.5	-	-

PROJECT COMPONENTS	OUTCOME	EXPECTED CONCRETE OUTPUTS	ORIGINAL AMOUNT (US\$)	REVISED BUDGET (US\$)	Difference	Material Change of project costs
	Financial Management and Legal support		123,165	123,165	-	-
	Evaluation and Knowledge Management support including Reporting		123,165	123,165	-	-
	Overall Administration and support costs		61,582.5	61,582.5	-	-
	7. Project Cycle Management Fee charged by the Implementing Entity (8.5%)		615,825	615,825	-	-
	8. Amount of Financing Requested		7,860,825	7,860,825		

Project disbursement

	Disbursement Schedule								Total
	Original				Revised				
Date	30 Dec 12	15 April 13	15 April 14	15 April 15	30 Dec 12	2020	2022	2023	
Project Funds	1,464,700	2,231,100	2,002,100	1,547,100	1,464,700	2,231,100	2,629,836	919,364	7,245,000
Implementing Entity	124,500	189,643	170,178	131,504	124,500	189,643	223,536	78,146	615,825

Annex 5: Project technical review undertaken by the AFB Secretariat and shared with IFAD



ADAPTATION FUND

ADAPTATION FUND BOARD SECRETARIAT TECHNICAL REVIEW OF PROJECT/PROGRAMME PROPOSAL

PROJECT/PROGRAMME CATEGORY: Regular-sized Full Proposal

Country/Region: **Lebanon**
 Project Title: **Climate Smart Agriculture: Enhancing Adaptive Capacity of the Rural Communities in Lebanon (AgriCAL)**
 Thematic Focal Area: **Agriculture**
 Implementing Entity: **International Fund for Agricultural Development (IFAD)**
 AF Project ID: **LBN/MIE/Agri/2012/1**
 IE Project ID: **AFB01** Requested Financing from Adaptation Fund (US Dollars): **7,860,825**
 Reviewer and contact person: **Mahamat Assouyouti** Co-reviewer(s): **Alyssa Maria Gomes**
 IE Contact Person: **Nicolas Tremblay**

Technical Summary	<p>The Adaptation Fund Board (the Board) at its eighteenth meeting, approved a four-year project titled “Climate Smart Agriculture: Enhancing Adaptive Capacity of the Rural Communities in Lebanon (AgriCAL)”, submitted by the International Fund for Agricultural Development (IFAD) for a requested amount of US\$ 7,860,825 (Decision B.18/18).</p> <p>The aim of the project is to support the implementation of climate change adaptation measures in the agriculture sector in three highly vulnerable areas in Lebanon, targeting the poor smallholders of various communities living in these areas. The executing entity of the project is the Ministry of Agriculture.</p> <p>The project agreement was signed between the Board and IFAD in January 2012 but due to some delays at inception, the project started implementation only on 15 September 2015.</p> <p>The project original completion date was 21 November 2017. However, the implementing entity has submitted three requests for extension of project completion date which were approved by the Board to postpone the project completion date to 21 April 2019.</p>
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	<p>(Decision B.30-31/16), thereafter to 21 October 2020 (Decision B.32-33/18) and recently postponed to 21 April 2022 (Decision B.35.a-35.b/42).</p> <p>Since its inception, the project only submitted the first PPR the period September 2012-February 2020 which was cleared by the secretariat on April 2020.</p> <p>On 30 April 2021, after multiple exchanges with the secretariat on the project implementation issues, the entity submitted a request for project change which has been reviewed by the secretariat.</p> <p><u>Requested financing overview:</u> Project/Programme Execution Cost: USD 688,200 Total Project/Programme Cost: USD 7,245,000 Implementing Fee: USD 615,825 Financing Requested: USD 7,860,825</p> <p>The initial review raised several issues pertaining to cost-effectiveness, financial sustainability, clarifications on operation and maintenance of concrete interventions and ESP and GP compliance and other relevant issues as is discussed in the number of Clarification Requests (CRs) and Corrective Action Request (CAR) raised in the review.</p> <p>The final technical review finds that all CRs and CARs raised have been sufficiently addressed at concept proposal stage.</p>
Date:	02/23/2022

Review Criteria	Questions	Comments	Comments
Country Eligibility	1. Is the country party to the Kyoto Protocol?	Yes	-
	2. Is the country a developing country particularly vulnerable to the adverse effects of climate change?	Yes With a primary economic sector dependent heavily on rain-fed agriculture, Lebanon faces the adverse effect of climate change in multiple ways. Agriculture in Lebanon is one	-

		<p>of the most vulnerable sectors to climate change due to the limited availability of water and land resources and the pressure exerted by population growth and urbanization. Latest data from Lebanon's Ministry of Environment in shows that by 2040, temperatures will increase from around 1°C on the coast to 2°C in the mainland, and by 2090 they will be 3.5°C to 5°C higher. Rainfall is also projected to decrease by 10-20% by 2040, and by 25-45% by the year 2090, compared to the present. This combination of significantly less wet and substantially warmer conditions will result in an extended hot and dry climate.</p>	
Project Eligibility	1. Has the designated government authority for the Adaptation Fund endorsed the project/programme?	Yes. As per the Endorsement letter dated April 29, 2021.	-
	2. Does the length of the proposal amount to no more than Fifty pages for the project/programme concept, including its annexes; or One hundred pages for the fully-developed project document, and one hundred pages for its annexes?	Yes	-
	3. Does the project / programme support concrete adaptation actions to assist the country in addressing adaptive capacity to the	Yes An updated climate risk analysis has been added on pages 3 -5. The revised proposal also includes an analysis of the relevance of AgriCAL's activities (efficient use of irrigation	-

	adverse effects of climate change and build in climate resilience?	water, sustainable rangeland management, early warning systems and promoting climate smart agriculture) in contribution to Lebanon's current adaptation priorities under Lebanon's Nationally Determined Contribution (NDC) targets for the agriculture and water sectors (pages 8-11).	
	4. Does the project / programme provide economic, social and environmental benefits, particularly to vulnerable communities, including gender considerations, while avoiding or mitigating negative impacts, in compliance with the Environmental and Social Policy and Gender Policy of the Fund?	<p>Not clear.</p> <p>A justification for the modification and deletion of activities has been provided. The main reason being to ensure that the project activities remain relevant to the current context. These changes do not result in a change to the overall objective of the project but instead the revisions better meet that overall objective considering the current situation. However, considering these changes, the environmental, economic and social benefits should be appropriately updated to reflect the anticipated benefits.</p> <p>CR1: In Section II.B please revise the section and clarify environmental, social, and economic benefits of the revised activities, considering the following points:</p> <ol style="list-style-type: none"> 1. Social and economic benefit -Include information on the expected beneficiaries of the project/programme, with particular reference to the equitable distribution of benefits to vulnerable 	<p>CR1: Clear, p. 41-44 The revised sections have clarified the social, economic and environmental benefits of revised activities.</p> <p>CR2: Clear, p. 39 and Annex 3 The revised proposal has clarified that women will be the main beneficiaries of the income generating activities. Furthermore, the voice of women in rural institutions will be increased by including them in small scale organizations such as water user associations. Improving the access to water at household level is expected to increase support to women with their domestic chores and reduce their overall workload. A gender matrix with gender considerations per activity has been included in Annex 3.</p> <p>CR3: Clear, p. 49-51.</p> <p>A detailed cost effectiveness analysis clearly demonstrating that the proposed changes are more cost effective in achieving the output's overall objective is included for all</p>

		<p>communities, households, and individuals.</p> <ol style="list-style-type: none"> 2. In target areas where marginalized and vulnerable groups and indigenous communities have been identified, particular benefits provided by the project/programme to those groups are outlined. 3. The estimated benefits are quantified, whenever possible. 4. There are no concerns of negative development or maladaptation <p>CR2: Based on the Gender Assessment that has been conducted, please clarify how the project will ensure considering the different needs, capabilities, roles and knowledge resources of women and men.</p> <p>Under component revised output 1.2, the AgriCAL project will construct an irrigation network for the 10 hill lakes in order for the water to reach the AgriCAL farmers. To achieve this, it is proposed that AgriCAL would construct 27.1km of irrigation network for 10 of these hill lakes. This is in addition to the 2 networks constructed under the WFP project. The table on page 30 provide a clear distinction between the networks constructed under the AF project and the WFP completed project.</p>	concrete outputs.
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		Activity focused on index insurance has been cancelled and references have been eliminated	
	5. Is the project / programme cost effective?	<p>Not clear.</p> <p>The proposal includes a description of alternative options to the proposed measures, to allow for an assessment of the project/programme cost effectiveness. The proposal also includes comparison to other possible interventions that could have taken place to help adapt and build resilience in the same sector, geographic region, and/or community, however quantitative estimates are not provides.</p>	

		CR3: Please provide quantitative estimates where feasible and useful. Please also clarify cost effectiveness is demonstrated from a sustainability point of view.	
	6. Is the project / programme consistent with national or sub-national sustainable development strategies, national or sub-national development plans, poverty reduction strategies, national communications and adaptation programs of action and other relevant instruments?	Yes The project is in line and consistent with major relevant national strategies.	-
	7. Does the project / programme meet the relevant national technical standards, where applicable, in compliance with the Environmental and Social Policy of the Fund?	Not clear CAR1: Please describe the process for complying with the Water Law No.77 of 2018 and Environmental Impact Assessment Decree No. 8633 of 2012 by linking relevant project outputs with which the regulations will apply in Section II.E. Details from Annex II. under Environmental impact assessment (principle 1) should be included in the main text. Please ensure that: 1. The relevant national technical standards are identified, and compliance stated in a logical manner. These include building	CAR1: Clear, p.56-59. The compliance process with relevant regulations, laws and technical standards is adequately clarified.

		<p>codes, water quality regulations, and any other sector-specific regulations.</p> <p>2. Compliance with relevant technical standards is explained in detail, addressing building codes, and land use or tenure regulations, as required by national legislation.</p> <p>3. If one specific activity of the project/programme requires compliance with technical standards, the steps taken to comply with it and the nature of the authorization/clearance granted for the project to be implemented is explained.</p>	
	8. Is there duplication of project / programme with other funding sources?	No.	-
	9. Does the project / programme have a learning and knowledge management component to capture and feedback lessons?	Yes.	-
	10. Has a consultative process taken place, and has it involved all key stakeholders, and vulnerable groups, including gender considerations in compliance with the Environmental and Social Policy and Gender Policy of the Fund?	<p>Not clear</p> <p>Consultations have been conducted as per Annex1 (pages 83-85). However, outcomes of community consultants should be mentioned in section II.H.</p> <p>CR4: Please update section II. H to also include the outcomes of community-level</p>	<p>CR4: Clear, p.76-77.</p> <p>The outcomes of consultations with the primary beneficiaries i.e. farmers and shepherd communities and their views on planned interventions in addressing declining water availability, reduce flood risk and increasing the participation of women and youth in livelihood activities are highlighted.</p>

		consultations i.e., the key consultation findings (in particular suggestions and concerns raised).	
	11. Is the requested financing justified on the basis of full cost of adaptation reasoning?	Yes.	-
	12. Is the project / program aligned with AF's results framework?	Yes.	-
	13. Has the sustainability of the project/programme outcomes been taken into account when designing the project?	<p>Not clear.</p> <p>CAR2: Section II.J is missing from the main text "Describe how the sustainability of the project/programme outcomes has been taken into account when designing the project / programme."</p> <p>The project will "pursue a written memorandum of understanding with the two farmers to formalize operation and maintenance arrangements and guarantee a minimum period (e.g., 5 years) for demonstration to other farmers and time slots of being open to other farmers". (Page 27).</p> <p>CR5: Please explain the arrangements through which this would be achieved, taking into account sustainability and maintenance of any infrastructure or installations to be developed, policies and governance arrangements to be developed and implemented, knowledge to be generated,</p>	<p>CAR2: Clear, p.80-83. Section II.J is now included.</p> <p>CR6: Clear p.80-81 Sustainability of water networks is expected to be ensured by the Green Plan which will provide institutional capacity development including technical capacity building and support to the water committees and WUAs. 10 out of the 12 hill lake networks will be managed by the municipalities who are well capacitated in terms of financial and maintenance follow up. The remaining two networks will be managed by WUAs and Green Plan. Rangeland interventions sustainability is ensure by the participatory approach taken to develop the rangeland management plans that ensure community ownership.</p> <p>CR5 and CR7: Clear, p.80 The project will also cooperate with relevant municipalities and WUAs to agree on the fee to be charged to the beneficiaries for the provision of the irrigation service to ensure proper</p>

		<p>management and other capacity to be improved, etc.</p> <p>CR6: Please address all key areas of sustainability are addressed, including but not limited to economic, social, environmental, institutional, and financial.</p> <p>CR7: Clarify what are the estimated costs for O&M of pilots under output 1.1 and fee to be charged to the beneficiaries for the provision of the irrigation service to ensure proper operation and maintenance of the networks (output. 1.2).</p> <p>CR8: Please clarify the process for selection of the 2 farmers to operationalize O&M arrangements.</p>	<p>operation and maintenance of the networks. Although not yet formalized, the estimated fee will be around USD 0.25 per cubic meter, which translates to around USD 100 per beneficiary per year. Output 2.2 was designed to ensure the sustainability of output 2.1 through proposing the most appropriate financial mechanism to the early warning system. The AgriCAL project was successful in driving a Public Private Partnership (PPP) between LARI and Debbane Company which is the local agent of Pessl, the manufacturer of the weather stations currently used by LARI all over the country. Debbane will provide LARI with Agrometeorological services at a fraction of the cost for 5 years in return for advertising rights in the EWS smartphone application. This agreement will ensure sustainability of the EWS for at least the coming 5 year. There is a possibility for extension in the event of the renewal of the agreement by both parties.</p> <p>CR8: Clear, p. 80 Related to water harvesting greenhouses, the project will also pursue a written memorandum of understanding with the two farmers to formalize operation and maintenance arrangements and guarantee a minimum period (e.g. 5 years) for demonstration to other farmers and time slots of being open to other farmers. The main details of the MoU has been agreed with the two framers, which would include the estimated annual maintenance costs that will not exceed around USD 300 per</p>
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			year. Detailed maintenance fees in also presented on page 80. The two farmers were selected mainly based on willingness to host the pilots, operate them and sustain them.
	14. Does the project / programme provide an overview of environmental and social impacts / risks identified, in compliance with the Environmental and Social Policy and Gender Policy of the Fund?	<p>Not clear A risk screening and assessment against AF ESP's 15 principles has been conducted. (Annex 2).</p> <p>Project is categorized as category B.</p> <p>CR9: Considering the proposed changes, please confirm the project categorization remains the same and no further assessment is needed.</p> <p>CAR3: Please include risk screen table in Section II.K "Provide an overview of the environmental and social impacts and risks identified as being relevant to the project / programme" of the proposal main text. This section is omitted from the main text currently.</p> <p>CAR4: The risk finding that <i>only</i> Principle 13 implies low risk is not justified. Given the nature of activities there are many potential risks for which continuous monitoring would be required. The potential risk to Access and Equity (exclusion from irrigated water), Gender Empowerment (risks to women's participation), Climate Change (Production of substantial amounts of greenhouse gasses, CO2 but also methane from cattle, goats,</p>	<p>CR9: Clear, p. The project category is confirmed as category B.</p> <p>CAR3: Clear, p.83-86.</p> <p>CAR4: Clear, p. 84-86. Risk assessments have been adequately updated and reflect appropriate clarification for the findings. The risk screening has been revised and the "Access and Equity", "Gender Empowerment" and "Land and Soil Conservation" were identified as low risk. A clarification for why the principle of Climate change is not seen as a risk has been provided in the response sheet which appears to be justified.</p>

		and sheep), Land and Soil Conservation (lands providing certain ecosystem services as precondition). An updated gender assessment and a gender matrix is submitted (Annex 3)	
Resource Availability	1. Is the requested project / programme funding within the cap of the country?	Yes	-
	2. Is the Implementing Entity Management Fee at or below 8.5 per cent of the total project/programme budget before the fee?	Yes	-
	3. Are the Project/Programme Execution Costs at or below 9.5 per cent of the total project/programme budget (including the fee)?	Not clear. There are a number of totalling errors in the sum of sub-components in Annex 3 Budget revision in the material change justification note. The total of component 2 in the revised budget return USD 1,012,800 and not USD 830,000. As a result, the sum of all components returns USD 6,399,800 and not USD 6,556,800. CAR5: Please revised the project budget to ensure there are no totalling errors. This would allow an assessment of whether the EC complies with the cap.	CAR5: Clear. Corrections have been made to Annex 3.
Eligibility of IE	1. Is the project/programme submitted through an eligible Implementing Entity that has been accredited by the Board?	Yes	-

Implementation Arrangements	1. Is there adequate arrangement for project / programme management, in compliance with the Gender Policy of the Fund?	Yes The project outlines management arrangements reflecting the gender considerations in line with the AF gender policy.	-
	2. Are there measures for financial and project/programme risk management?	Yes	-
	3. Are there measures in place for the management of for environmental and social risks, in line with the Environmental and Social Policy and Gender Policy of the Fund?	Yes. ESMP and Gender assessment have been added in Annex 2 and Annex 3.	-
	4. Is a budget on the Implementing Entity Management Fee use included?	Yes.	-
	5. Is an explanation and a breakdown of the execution costs included?	Yes.	-
	6. Is a detailed budget including budget notes included?	Not clear. The revised detailed budget includes totalling error. Please see CAR above. This impacts the Material Change calculation. CAR6: An increase in budget for “Output 2.1: Enhanced early warning system to farmers through improved existing system” from USD190,000 to USD 375,000, will not result in a reduction of 185,000 but an increase. There for “-185,000” is not accurate. Please correct.	CAR6: Clear. Corrects has been made in Annex 3 CAR7: Clear.

		CAR7: Please revise the material change calculation based on accurate subtotals. The material change is calculated by summing all the % (sums and subtractions). The sum of all positive percentage values and sum of all negative percentage values should return the name number (e.g., -10% and +10%).	
	7. Are arrangements for monitoring and evaluation clearly defined, including budgeted M&E plans and sex-disaggregated data, targets and indicators, in compliance with the Gender Policy of the Fund?	Yes.	
	8. Does the M&E Framework include a break-down of how implementing entity IE fees will be utilized in the supervision of the M&E function?	Yes.	
	9. Does the project/programme's results framework align with the AF's results framework? Does it include at least one core outcome indicator from the Fund's results framework?	<p>Yes, in Annex 1 and proposal main text.</p> <p>CAR8: Please ensure that the project result framework must include at least the core impact indicator "Number of beneficiaries including estimations for direct and indirect beneficiaries."</p> <p>A second core indicator must be added if the project includes activities targeting the areas identified in AF results framework, namely (1) Early Warning System; (2) Assets Produced, Developed; (3) Improved, or Strengthened; (4) Increased income, or avoided decrease in income or (5) Natural</p>	<p>CAR8: Clear, p. 104-105.</p> <p>The 'Number of Beneficiaries' indicator has been added and a second indicator on 'Assets Produced, Developed, Improved, or Strengthened'.</p>

		<p>Assets Protected or Rehabilitated.</p> <p>These tables can be added right after the result framework table.</p> <p>Refer to template on page 10 onwards: https://www.adaptation-fund.org/wp-content/uploads/2015/01/AF%20Core%20Indicator%20Methodologies.pdf</p>	
	10. Is a disbursement schedule with time-bound milestones included?	<p>The disbursement schedule is attached including the milestones.</p> <p>CAR9: The disbursement schedule is until 2023, please confirm if this is sufficient time. Please also update the disbursement schedule if needed after addressing CARs 5-7 above.</p>	<p>CAR9: Clear.</p> <p>The IE has confirmed that the time allocated for the disbursement schedule is sufficient and in line with the extension request.</p>

Annex 6: Revised proposal document with tracked changes addressing comments made by the secretariat in its initial review



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

The Adaptation Fund Board Secretariat
1818 H Street NW
MSN G6-602
Washington, DC. 20433
U.S.A
Fax: +1 (202) 522-3240/5
Email: secretariat@adaptation-fund.org

DATE OF RECEIPT:
ADAPTATION FUND PROJECT ID:
(For Adaptation Fund Board Secretariat Use
Only)

PROJECT PROPOSAL



PART I: PROJECT INFORMATION

PROJECT CATEGORY:	REGULAR
COUNTRY:	LEBANON
	Climate Smart Agriculture: Enhancing Adaptive Capacity of the Rural Communities in Lebanon (AgriCAL)
TYPE OF IMPLEMENTING ENTITY:	MULTILATERAL IMPLEMENTING ENTITY (MIE)
IMPLEMENTING ENTITY:	INTERNATIONAL FUND FOR AGRICULTURAL DEVELOPMENT
EXECUTING ENTITY:	MINISTRY OF AGRICULTURE
AMOUNT OF FINANCING REQUESTED:	USD 7,860,825

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.



Brief description of the problem

Lebanon is located on the eastern coast of the Mediterranean Sea with an east to west span from 36°03' E to 36° 37' E and north to south from 34° 41' N to 33° 02' N, covering an area of 10,452 km², with a coastline of 225 km and a maximum width of 80 km. Climate in the east Mediterranean is characterized by mild rainy winters from the westward moving cyclonic activity and long, hot dry summers brought about by persistent atmospheric subsidence influenced by the Asian monsoon. Lebanon's climate is further shaped by its unique topography with the coastal strip, the Lebanon and Anti-Lebanon mountain ranges, and the inland Bekaa plateau. Thus the coastal area and the western side of the Lebanon mountain range exhibit maritime characteristics, while the climate of the eastern side is more continental.

The Mediterranean is considered one of the most receptive hotspots of the Earth's climate system and is expected to be affected by the projected global warming and related changes. In particular in the eastern Mediterranean, heat stress is expected to intensify, while the winter precipitation will diminish due to the northward shift of the mid-latitude storm track. In addition to changes in the mean climate, changes in extremes may negatively impact human health, water resources, tourism, agriculture and energy demand, all of which are considered as critical sectors for the socio-economic stability of small countries like Lebanon.

The forces which drive the environment of Lebanon and the project area in particular are natural and/or man-induced, and are namely: climate change, land use and land degradation, insufficient water resources and risk of seasonal drought, inadequate agricultural practices, poverty, as well as weak policies and reduced collaboration among institutions

The use of water resources in Lebanon is approaching unsustainable levels. This is mainly due to a lack of effective management policies, increased consumption as a result of expansion of irrigated agricultural land, escalating uncontrolled exploitation of groundwater resources, population growth and industrial development. Biodiversity is under extreme pressure in many areas specially the North Bekaa area due to collection by locals for wood and excessive overgrazing.

All that is leading to desertification of arid or semiarid land. Characteristic of this process is the declining of the groundwater table and depletion of surface water supplies, the salinisation of water and topsoil, increasing erosion and decrease of natural vegetation. There is a major loss of water resources in many critical areas because of inadequate water harvesting structures (hill lakes, dams, etc.).

Land degradation is mainly caused by soil loss as a result of water and wind erosion, and deforestation. Based on the UNCCD Desertification Prone Areas (DPA) map, the high-risk areas can be identified as: (i) North Lebanon, mainly Akkar, Koura and Zgharta; (ii) the Bekaa Plain, mainly Baalbeck-Hermel and partly West Bekaa and Rachaya; and (iii) Southern Lebanon, mainly Saida, Sour, Nabatieh, Bint Jbeil and Marjaayoun. Major threats contributing to land degradation in the project area include: Drought, Wind and water erosion, flash floods, improper water management, overexploitation of groundwater resources, overgrazing, quarrying, unsustainable agricultural practices, unplanned urban sprawl, deforestation, soil erosion, absence of land use planning, pollution, poverty and limited economic opportunities, forest fires, unsustainable charcoal production, excessive fertilizer and pesticide use, etc.

Lebanon's Second National Communication (SNC) to the UNFCCC¹ prepared by the Ministry of Environment in 2011 with the support of GEF and UNDP, developed climate change scenarios with vulnerability and adaptation assessments. Accordingly, and in relation to the present climate, by 2040 temperatures will increase from around 1°C on the coast to 2°C in the mainland, and by 2090 they will be 3.5°C to 5°C higher. Comparison with Lebanese Meteorological Service historical temperature records from the early 20th century indicates that the expected warming has no precedent. Rainfall is also projected to decrease by 10-20% by 2040, and by 25-45% by the year 2090, compared to the present. This combination of significantly less wet and substantially warmer conditions will result in an extended hot and dry climate. Temperature and precipitation extremes will also intensify. The drought periods, over the whole country, will become 9 days longer by 2040 and 18 days longer by 2090.

As per Lebanon's Third National Communication to the UNFCCC, these climate change hazards are still relevant to Lebanon in 2021 with higher degree of confidence and the impacts are being felt especially in rural areas. These hazards and impacts can be summarised as follows:

Climate Change Hazards:

Temperature Increase: Lebanon has a Mediterranean-type climate characterized by hot and dry summers (June to September) and cool and rainy winters (December to mid-March). Spring and autumn are warm and pleasant. The average annual temperature is 15°C. Along the coast, summers are hot and humid with temperatures crossing 35°C in August but due to the moderating effect of the sea, the daily temperature range is narrower than it is inland. January is the coldest month, with temperatures around 5 to 10°C. However, climate projections show an overall increase of 1.2°C and 1.7°C (RCP4.5 and RCP8.5, respectively) by mid-century (2046-2065) and up to 3.2°C by 2100 compared to the baseline period of 1986-2005. Temperature extremes will also intensify by

the end of the century. Projections show increasing trends of warming, reaching 15 to 43 additional days (RCP4.5 and RCP8.5 respectively) with maximum daily temperature higher than 35°C².

Decline in Precipitation: The mean annual rainfall on the coast ranges between 700 and 1,000mm. About 70 per cent of the average rainfall in the country falls between November and March and is concentrated during only a few days of the rainy season, falling in heavy cloudbursts or violent storms. Precipitation in inland Lebanon is higher than precipitation along the coast (1,600 mm) with snow in the mountains. However, climate projections predict an overall decrease in precipitation of 4 per cent to 11 per cent (RCP4.5 and RCP8.5, respectively), with drier conditions by the end of the century (up to 5.8 mm decrease in average monthly precipitation). Precipitation extremes will also intensify by the end of the century, causing- combined with increased temperature- the seasonal prolongation and geographical expansion of drought periods. The projections also trends towards drier conditions with an increase in number of consecutive dry days (maximum annual number of consecutive dry days when precipitation < 1.0 mm) by the end of the century. This indicated that the dry summer season will extend in length, projected by an additional maximum number of 6 consecutive drought days. This combination of significantly less wet and substantially warmer conditions will result in hotter and drier climate. There will also be a decline in snow coverage with a decrease in snow residence time from 110 days to 45 days³.

Sea Level Rise: Coastal areas in Lebanon are vulnerable to sea level rise and it is expected that sea levels will rise up to 30-60 cm within 30 years, if the recent rate of rise, approximately 20 mm/year, continues⁴.

Extreme Events: Lebanon will face increased risk of extreme events. Projections show that droughts will likely become more frequent and severe due to the combination of increased temperature and decreased precipitation. Droughts will occur 15 days to 1 month earlier, and countrywide drought periods will extend 9 days longer by 2040 and 18 days longer by 2090. The already dry regions, such as the Bekaa, Hermel, and the South, will experience the sharpest effects. However, there is also an increased risk of flooding. Over the past decade, Lebanon already witnessed a high number of severe rainfalls that can cause flooding. These flash floods can even occur in dry areas where the land is not equipped to absorb the excess moisture. It is also very likely that heat waves will occur more frequently and for longer because of seasonal mean temperature increases. Changes in the absolute value of temperature extremes are very likely in Lebanon and are expected to exceed the global average⁵. National stakeholders agree that extreme events namely forest fires, drought and flooding are increasingly becoming a major concern for the country.

Climate Change Impacts

Decline in water availability: Snow will melt earlier in spring due to increased temperature. These changes will affect the recharge of most springs, reduce the supply of water available for irrigation during summer, and increase winter floods by up to 30 per cent. The declines in precipitation will also exacerbate existing challenges to water availability for agriculture, commercial and residential uses. This will have adverse impacts on rivers and groundwater recharge, and will affect water availability during the summer season and in drought periods⁶. It is reported that for dry years, GDP

² Ministry of Environment and UNDP (2016). Lebanon's Third National Communication to the UNFCCC.

³ Ibid

⁴ Ibid

⁵ World Bank (2018). Droughts and Agriculture in Lebanon.

⁶ Ministry of Environment and UNDP (2016). Lebanon's Third National Communication to the UNFCCC.

is estimated to have lost 60 per cent compared to years when total precipitation reached its optimal level⁷.

Lower agricultural productivity: Soil moisture will decline in response to higher temperatures, reduced precipitation, and higher evapotranspiration. Changes in temperature and rainfall will decrease productivity of lands currently used to produce most crops and fruit trees, especially wheat, cherries, tomatoes, apples, and olives. Most crops will also face increased infections due to fungi and bacterial diseases⁸.

Seawater intrusion: The higher sea levels will lead to seawater intrusion into aquifers, increase the risk of coastal flooding and inundation, increase coastal erosion, alter coastal ecosystems and damage coastal infrastructure⁹.

Higher risk on forests: Forests in Lebanon already suffer from fragmentation, pest outbreaks, forest fires and unsuitable practices that already challenge their capacity to survive and develop and climate change is expected to exacerbate these challenges¹⁰.

Increase in diseases: Lebanon will experience increases in the incidence of infectious diseases, morbidity, and mortality resulting from higher temperatures, more frequent extreme weather events, increased malnutrition from droughts and floods that affect agriculture, and reduced availability of clean water. Increases in temperatures are estimated to cause 2,483 to 5,254 additional deaths per year between 2010 and 2030¹¹.

Higher energy demand: Higher temperatures in summer will increase demand for cooling, with related consumption of electricity increasing 1.8 per cent for a 1°C increase in temperature, and 5.8 per cent for a 3°C increase in temperature¹².

Agriculture in Lebanon is one of the most vulnerable sectors to climate change due to the limited availability of water and land resources and the pressure exerted by population growth and urbanization. The results of the SNC assessment show that higher temperature, reduced precipitation and higher evapo-transpiration will decrease soil moisture and increase aridity, which will affect the overall agricultural yield of crops. A decrease in productivity is expected for most of the crops and fruit trees. Small ruminants depending on natural grazing areas are vulnerable to climate. Such situation keeps the rural population exposed to poverty, as the production of their herds is dramatically decreased.

Chilling needs for mountainous fruit trees such as cherries and apples will not be met, leading to a risk of failure of blossom pollination and fecundation by up to 50%. Changes in climate will also lead to increased infestation of fungi and bacterial diseases for most of the crops. Irrigated crops will face water shortages due to increased water demand and decreased water availability for irrigation. Rainfed crops will show either no change or a decrease in their surface area or productivity

Changes in temperature and rainfall will also affect the grazing period and the quality of the pastures, changing the species composition in favour of woody less palatable plants. Grazing areas in both the Anti-Lebanon and Mount Lebanon chains, namely in the northern part are amongst the most vulnerable zones. However, increase in temperature will lead to an expansion of the coastal plantations such as banana and tomatoes to higher altitudes and herders would benefit from a longer pasture season in the mountains due to the reduced thickness and residence time of snow cover.

⁷ Ministry of Environment (2021). Lebanon's Nationally Determined Contribution. *Updated 2020 Version*.

⁸ Ministry of Environment and UNDP (2016). Lebanon's Third National Communication to the UNFCCC.

⁹ Ibid

¹⁰ Ibid

¹¹ Ministry of Environment and UNDP (2016). Lebanon's Third National Communication to the UNFCCC.

¹² Ibid

Adaptation to climate change is vital not only to support the livelihood of rural populations and to sustain the viability of the agriculture sector, but also to maintain an acceptable level of food security.

The key adaptation measure for climate change is setting and implementing a sustainable agriculture policy. Adaptation measures vary horizontally according to the agricultural sub-sectors and their vulnerability to climate change. These measures vary vertically according to the different actors involved in the development and implementation of this policy.

Based on UNFCCC guidance, adaptation measures for the agriculture sector are divided into two groups: field-level measures and institutional measures.

Prioritization of technologies for climate change adaptation in Lebanon

The UNDP and the Ministry of Environment are conducting a Technology Needs Assessment (TNA) for climate change adaptation for agriculture and water sectors. The project embeds the identification of the most relevant technologies for Lebanon, and the selection of prioritized technologies to be promoted. The process followed a participatory approach involving a consultation workshop with technicians. Criteria of selection for agriculture included: capital and operational cost, importance of economic impact, improvement of resilience to climate, technology capability and suitability for the country, human and information requirement and social suitability for Lebanon. As for the water sector, The criteria of selection included: capacity to increase water supply and water efficient use, extent of use, need for human resources and knowledge, required infrastructure, cost of the technology (capital and operational), and social acceptance. A multi-criteria analysis (MCA) enabled all participants to choose the priority technologies with the highest scores as mentioned in the tables below. Many of these technologies are proposed by the different components of the project. A list of technologies for the adaptation of both agriculture and water sectors is prioritized and listed in the tables below:

MCA results for the technologies related to the agriculture sector:

Technology (Agriculture sector)	MCA score
Conservation Agriculture	7.75
Risk Coping Production Systems	7.275
Integrated Pest Management	6.85
Selection of Adapted Varieties and Rootstocks	7.9
Integrated Production and Protection (greenhouses)	4.9

Early Warning Systems/Information and Communication Technologies 6.8
MCA results for the technologies related to the water sector:

Technology (Water sector)	MCA score
Rainwater harvesting from greenhouses	7.375
Rainwater harvesting from roads (and roof tops)	6.90
Water users' association	6.35
Efficient water use irrigation systems	8.95
Rainwater harvesting from hill lakes	5.775
Early warning system for water supply management through snow pack monitoring	5.30
Use of treated wastewater in irrigation	5.45
Soilless agriculture	4.275

Among these technologies water harvesting from roads and greenhouse tops combined with water efficient use are identified. As for agriculture, selection of adapted varieties and rootstocks as well as good agriculture practices (including early warning and integrated pest management) are selected and will be the main technologies that AgriCal project will work on. AgriCAL is still relevant in 2021 as it directly contributes to Lebanon's Nationally Determined Contribution (NDC) targets for the agriculture and water sectors.

Updated adaptation priorities for water and agriculture sectors include¹³:

- Enhancing the efficient use of irrigation water and expand the supply of surface water sources for irrigation;
- Building an operational and sustainable legal and institutional framework to ensure a proper management of the water sector allowing the development of sustainable and efficient services;
- Developing financing tools for the sector to set-up financial mechanisms allowing the sustainability and the financial balance of the services;
- Involve all actors in the service chain and establish sustainable mechanisms for collaboration and coordination to improve the sector monitoring and transparency;
- Implementing the Beirut Water Declaration¹⁴;
- Promoting alternative water sources especially through rainwater harvesting (e.g. from roads and greenhouse tops).
- Imposing stricter control of wells, increase staffing within water establishments and build the capacity of staff on monitoring of unlicensed wells.
- Establishing water user associations to better manage water resources.
- Implementing measures to reduce the exposure of freshwater aquifers being exposed to seawater intrusion.

¹³ Adapted from the Third National Communication, the 2015 INDC and the updated 2020 version of the NDC.

¹⁴ <https://www.riob.org/en/file/280436/download?token=plghIHCP>

- j. Improving water security such as through increasing artificial recharge of groundwater aquifers and increasing surface storage dams and hill lakes.
 - k. Improving the availability of information about the country's water resources and water systems and building capacities for climate change adaptation in the water sector.
 - l. Imposing new water tariffs to encourage behavioural changes and raising awareness of citizens on water conservation.
 - m. Establishing standards for wastewater reuse using regional standards as a baseline and increasing wastewater treatment.
 - n. Restore the livelihoods and productive capacity of farmers and producers;
 - o. Increase agricultural production and productivity;
 - p. Enhancing efficiency and competitiveness of agri-food value chains including fisheries;
 - q. Encouraging private investment along the agri-food value chain including innovative technical solutions and improved access to climate finance and insurance;
 - r. Increasing resilience of households with reference to food and nutrition security;
 - s. Strengthening the enabling institutional environment for climate-smart agriculture;
 - t. Introducing heat-resistant and drought-tolerant crop varieties.
 - u. Changing timing of planting, irrigation, and harvesting.
 - v. Raising tree nurseries' productivity.
 - w. Adopting sustainable agricultural practices and promoting organic farming.
 - x. Establishing early warning systems to provide farmers with timely information about extreme weather events.
 - y. Adapting forest systems to climate change by halting land degradation, controlling erosion of topsoil, improving water quality and soil productivity;
 - z. Promoting sustainable rangeland management.
-

Relevance of AgriCAL to 2020 NDC Adaptation Priorities in Lebanon

NDC priorities relevant to Agriculture and Water ¹⁵	NDC priorities relevant to Agriculture and Water ¹⁶	AgriCAL contributions to the national NDC targets
<i>Strengthen the agricultural sector's resilience to enhance Lebanon's agricultural output in a climate-smart manner</i>	Restore the livelihoods and productive capacity of farmers and producers	AgriCAL is helping in building capacities of farmers for climate smart agriculture techniques through a weather based early warning system as well as demonstrations and provision of equipment in cooperation with the Lebanese Agriculture Research Institute (LARI).
	Increase agricultural production and productivity	AgriCAL is investing in improved water management through rainwater harvesting and improved irrigation as well as building capacities for climate smart agriculture techniques through demonstrations and provision of equipment.
	Enhance efficiency and competitiveness of agri-food value chains including fisheries	x
	Encourage private investment along the agri-food value chain including innovative technical solutions and improved access to climate finance and insurance	x
	Strengthen the enabling institutional environment for climate-smart agriculture	Through AgriCAL policy component, IFAD is supporting the mainstreaming of climate smart agriculture measures into the policies and regulations, preparing guidelines on adaptation techniques in agriculture and providing technical support to the climate change unit at the Ministry of Environment
	Increase resilience of households with reference to food and nutrition security	The main objective of the AgriCAL project is to increase resilience of agricultural communities to climate change through investments in water management, agricultural adaptation, rangeland management and policy frameworks
<i>Promote the sustainable use of natural resources, restore degraded landscapes, and</i>	Achieve the goals listed in the Brummana Declaration for the Role of Mediterranean Forests to Fulfil the NDCs ¹⁷	x
	Adapt forest systems to climate change by halting land degradation, controlling erosion	x

¹⁵ Ministry of Environment (2021). Lebanon's Nationally Determined Contribution. *Updated 2020 Version*.

¹⁶ Ibid

¹⁷ <https://vi-med.forestweek.org/sites/default/files/resources/files/brummana-declaration.pdf>

NDC priorities relevant to Agriculture and Water¹⁵	NDC priorities relevant to Agriculture and Water¹⁶	AgriCAL contributions to the national NDC targets
<i>increase Lebanon's forest cover while meeting the ecological, social and economic needs of sustainable forest management</i>	of topsoil, improving water quality and soil productivity	
	Establish sites with improved production capacity linking with the development of wood and non-wood forest product processing industry and with the people's needs in terms of goods and services and improved employment opportunities	x
	Promote sustainable rangeland management;	AgriCAL project is supporting the development of community-based sustainable rangeland management plan as well as restoring rangeland areas and reducing flood risks.
	Reduce the risk of intense and frequent forest fires through the development of fire prevention measures and early warning systems	x
	Manage pest and disease outbreaks to protect forests and forest resources	x
<i>Structure and develop sustainable water services, including irrigation, in order to improve people's living conditions</i>	Implement the Beirut Water Declaration ¹⁸	AgriCAL is building on HASAD's achievements to provide water from non-conventional sources through rainwater harvesting and to increase water use efficiency as agreed in the Beirut Water Declaration.
	Enhance the efficient use of irrigation water and expand the supply of surface water sources for irrigation	AgriCAL project complements the outputs of HASAD project- where the hill lakes were established- by providing on-farm water efficient irrigation systems and training on their installation and use.
	Encourage and support the use of renewable energy in agricultural irrigation and in drinking water supply	AgriCAL project will install solar-powered irrigation as part of the rehabilitation process of one large nursery in Abdeh with a capacity of 425,000 aromatic plants.
	Build an operational and sustainable legal and institutional framework to ensure a proper management of the water sector allowing the development of sustainable and efficient services	x
	Develop financing tools for the sector to set-up financial mechanisms allowing the	x

¹⁸ <https://www.riob.org/en/file/280436/download?token=plghIHCp>

NDC priorities relevant to Agriculture and Water ¹⁵	NDC priorities relevant to Agriculture and Water ¹⁶	AgriCAL contributions to the national NDC targets
	sustainability and the financial balance of the services	
	Involve all actors in the service chain and establish sustainable mechanisms for collaboration and coordination to improve the sector monitoring and transparency	x

National socio-economic and development context

Lebanon is a small mountainous country with a total area of about 10 450 km² and a resident population estimated at 4.1 million in mid-2007. The annual population growth rate is estimated at 1.2% in the period 2001-2007. The Rural population accounts for only 13% of the population with a significant annual decrease, estimated at about minus 3%. The population of Lebanon is unevenly distributed among its six administrative regions (mohafazat). About 50% of the population lives in Beirut and Mount Lebanon whereas about 21 % lives in North Lebanon and 13% in the Bekaa Valley. Lebanon is made up of four major physiographic units running on a north-south parallel to the sea: (i) a narrow, fertile coastal plain; (ii) the Mount Lebanon range, including the country's highest peak at 3 083 m above sea level; (iii) the fertile Bekaa Valley 8 to 10 km wide at elevation of about 900-950 m asl; and (iv) the Anti-Lebanon range bordering Syria.

Lebanon is an upper middle-income country. In 2007, the country's Gross Domestic Product (GDP) stood at about USD 24.5 billion with a per capita income of about USD 5800. Remittances accounted for about 25% of the GDP. The national economy is dominated by the service sector (e.g. commerce, tourism and financial services) which in 2007 accounted for 70.1% of the GDP, while agriculture and industry contributed 6.1% and 13%, respectively. By the end of 2007, Lebanon's gross public debt stood at approximately 168% and the fiscal deficit reached approximately 10.16% of GDP. The slow economic and fiscal recovery from the 2006 hostilities and the recent wave of external shocks from high international oil and food prices, the international financial crisis, and regional political and security unrest pose challenges in the medium term macroeconomic outlook. However, despite of all these challenges the conditions have improved somewhat, so far. Growth remains strong, the government debt-to-GDP ratio is on a downward trend to 160% of GDP in 2008, deposit inflows have accelerated, and the Central Bank's foreign reserve position is now much stronger. The top priority, however,

remains further lowering the public debt-to-GDP ratio toward sustainable levels to preserve market confidence and maintain strong deposit inflows, which are needed to satisfy the government's large financing requirements.

According to the World Bank, the resilience of the Lebanese economy has been demonstrated by its ability to recover following the civil war, the recent hostilities and the prolonged political crisis amid continued regional uncertainty. The economy relies on large amounts of short-term capital transfers from abroad. The country's strong entrepreneurial culture is another valuable asset. Policy makers intend to provide the necessary infrastructure—as well as continue funding human resources development—for the private sector to lead the recovery of Lebanon's economy and its re-emergence as a regional hub for trade and services.

Poverty profile

The most recent poverty profile published in October 2007, the UNDP Poverty, Growth and Inequality in Lebanon, indicates the worsening of poverty during the last few years. The study, which accounts for the consumption patterns and prices that exist across regions in the country and the basic needs of different household members, discerned the extreme poverty line and the poverty line at USD 2.4 per capita and USD 4 capita per day respectively. The poverty profile for 2005 gives an overall poverty headcount of 28.5%. Of those, 8% live under conditions of extreme poverty which means that about 300 000 individuals in Lebanon are unable to meet their food and non-food basic needs. National accounts data point out that real per capita private consumption grew at 2.75% in 2005 but the project report indicates that the distribution of this growth was very uneven. Not surprisingly, Beirut had the highest growth rate per capita consumption at 5% and the Nabatieh, Bekaa, and South governorate recorded higher than average rate of growth in consumption expenditure at 4%. The North however witnessed insignificant growth in expenditure at only 0.14%. This is important to put in perspective as the progress in development was severely shocked and taken back by the 2006 war in the following year. The study estimates that extreme poverty has increased by nearly 5% accounting for 8.4% in 2007 as a result of the war.

Despite some improvements in the last decade, poverty remains a serious problem in Lebanon and was further exacerbated by the 2006 war. Poverty is mostly prevalent among agricultural workers and unskilled workers in services, construction and industries. A large proportion of unskilled workers have come from rural areas where lack of job opportunities has forced residents to seek occupations in the large urban centers. Past development efforts in Lebanon have concentrated for the most part on the major urban cities particularly concentrating on the capital, Beirut. There is a huge disparity in the geographic distribution of poverty with a heavy concentration of poverty in rural areas such as the South, Akkar, Hermel and Baalbek which has persisted for decades. This disparity in development has seen many of the rural inhabitants migrate to urban centers and settle in the poor suburbs seeking better opportunities, but for the most part few are able to rise out of poverty. Rural poverty in Lebanon is the intrinsic factor to poverty alleviation in Lebanon.

Agriculture and poverty

Agriculture is a main source of employment and income in rural areas. Recent surveys in some of the poorest rural areas of Lebanon show that agriculture accounts on average for over 50% of total household income (ranging from about 26% to 75%). Especially in the poorest categories of households, total income in these rural areas is positively correlated with the share of agricultural income, whereas the relative share of agricultural income decreases only in the highest income categories. This suggests that the development of agriculture may be conducive to an overall improvement in income and especially lifting the poor rural households out of poverty.

Although agriculture has a relatively minor contribution to Lebanon's overall economy, it plays an important role in rural areas, especially the poorest ones. The rural population accounts for an estimated 20 to 25% of the active population of Lebanon that has some activity in agriculture (on a full time or part time basis, including seasonal family labour). In many rural areas, agriculture is the main source of employment and income for the resident population. In particular, in many of the villages in the south of Lebanon as well as in Baalbeck and Hermel (Northern Bekaa) and Akkar (North Lebanon), agriculture accounts for up to 80% of the local GDP and represents the major income-earning and employment opportunity. These regions correspond to the poorest areas in the country.

Within agriculture, crop production is estimated to account for about 72% of the total value of agricultural production. Livestock is estimated at around 142 000 heads of large ruminants and 785 000 heads of small ruminants (MOA 2008). The natural pastures in Lebanon are poor, and seed production is low. Livestock nutrition, therefore, relies on expensive imported feeds. In the hilly areas, sheep and goats are kept in extensive and semi-sedentary systems, where productivity is low.

Over the years, agricultural land use in Lebanon has gradually changed from production systems based on cereals to more intensive production of fruits and vegetables. As a result, agricultural value-added per hectare is much higher in Lebanon than in neighboring countries. The annual production data published by MOA indicates that the use of cultivated land is dominated by tree crops and since 2004 fruit trees rank first and occupy 30% of the total cultivated area, followed by cereals (25%), olive trees (21.8%) and root crops (9%). The remaining 18% are distributed among industrial crops, legume and others. The agricultural production contribution per district is the highest for Bekaa with around 39% of the total production followed by North Lebanon with around 28%, South Lebanon including Nabatiyyeh with 22%, and finally Mount Lebanon with only 12% of the total.

Water resources

Lebanon faces significant challenges in meeting the country's water demand in terms of quantity and quality. Unsustainable water management practices, water governance shortcomings, and environmental risks including climate change are among the main obstacles facing the sector.

Yearly precipitation results in an average yearly flow of 8,600 million m³ (Mm³), giving rise to 40 streams and rivers and over 2,000 springs. About 1,000 Mm³ of this flow comes from over 2,000 springs with an average unit yield of about 10–15 l/s (FAO, 2008). Since Lebanon is at a higher elevation than its neighbors, it has practically no incoming surface water flow (FAO, 2008).

Amid the absence of consistent information, it is generally accepted that approximately 50% of the average yearly precipitation (8,600 Mm³) is lost through evapotranspiration, while additional losses include surface water flows to neighboring countries (estimated by the Litani River Authority to represent almost 8%) and groundwater seepage (12%). This leaves around 2,600 Mm³ of surface and groundwater that is potentially available, of which around 2,000 Mm³ is deemed exploitable (MoE, 2001) consisting of 1,500 Mm³ of surface water and 700–1,165 Mm³ of groundwater (MED EUWI, 2009).

Further studies have assessed agricultural water withdrawal assessment based on 11,200 m³/ha/yr from surface water and 8,575 m³/ha/yr from ground water resources (FAO, 2008). The use of groundwater for irrigation has increased during recent years. This situation has encouraged individual farmers to cope with water shortages by increasingly relying on private wells (Hreiche, 2009).

Irrigation is a key requirement for agricultural productivity in most parts of Lebanon, given its prevailing Mediterranean climatic features with scarce precipitation during the main summer growing season. Area under irrigation increased from about 40,000 ha in the early 60s to over

104,000 ha currently equipped for irrigation.

Irrigation has been a main factor to enable intensification of cropping patterns through the development of high value-added production (vegetables and fruit). Water scarcity, rather than land resources, is currently limiting the expansion of agricultural production. Nonetheless, water efficiency in most existing irrigation schemes is usually quite low especially in the large to medium scale irrigation schemes built with public funds. At the same time, uncontrolled private well drilling and pumping result in a significant lowering of the water table and increased salinity.

The geographic coverage of the project

In order to better maximize the socio-economic impact of the project through working on the farmer communities and rural poor. The geographic targeting process is based on the agreement on: national coverage of the project pre-selection criteria; their application, and identification of three Focus Areas. This process was developed and finalized during the design of the IFAD HASAD project and was adopted throughout the design of the AgriCal project.

The following targeting criteria have been identified: (a) High Density of Poverty Pockets; (b) Low level of farm household productive potential, measured through the average number of Farm-Units or "Unité-Exploitation"; (c) Importance (and persistence) of War Damages in the Agricultural sector; (d) Areas Prone to Desertification (APD) and vulnerable to climate change; and (e) Water harvesting potential and high-value crops potential.

Each of the above mentioned criteria was given the same weight. All the areas selected along one or more of the above criteria were overlaid and their simple weights were summed vertically or geographically using a GIS system. As a subsequent step, each cadastral village was given the average value of the summation process, producing therefore the "Project Focus Areas" selection map.



As a result, three main Focus Areas for possible project-support have been delimited, and analyzed. These are: (i) Akkar-Danniyehh; (ii) North Baalbek and Hermel; and (iii) South Litani below Lake Karaoun. They correspond to areas where project activities would be concentrated and are illustrated in the following figure.

The three Focus Areas have then been analyzed utilizing the concept of ZAH (Homogeneous Agricultural Zones) elaborated by MOA in the framework of the Agricultural Census. Out of a total of 40 ZAHs identified by MOA at national level, the three project Focus Areas cover the totality or the largest part of 16 of them.

Moreover, Outcome 4 related to policy and knowledge management has a national dimension and will contribute towards moving the climate change adaptation agenda forward in Lebanon. In addition some of the project outputs and activities will be implemented at the national level namely:

- Output 2.2: Expanded farmer outreach and ensured financial and management sustainability of the early warning system
- Output 2.4: Guidelines and recommendations on agricultural adaptation techniques for vulnerable areas developed
- Output 2.5: National fodder resource assessment prepared
- Output 4.1 Policy advocacy activities implemented
- Output 4.2 Knowledge management system established and knowledge management activities implemented

The project location context

The target group would be comprised of the poor smallholders of various communities of Lebanon living in the three identified focus areas. The project financial resources will thus serve to achieve greater regional equity through targeting project benefits towards the poor. In particular, it has been decided that activities financed by the project will focus on selected rainfed, hilly, poor areas, and will have a demand-driven and participatory nature. There is a relatively important overlapping between areas vulnerable to climate change and prone to desertification and poverty levels to identify the project area as the hilly areas in three zones – Akkar-Dannieh, North Baalbeck and Hermel, South regions and Lower Litani (below lake Karaoun and covering parts of the Mohafazat of Nabatiyeh and South Lebanon) – as the three main (but not exclusive) focus areas for project interventions in view of the high proportion of vulnerable households living in these areas. Geographical targeting is described in the following sections. The project target group will therefore consist of poor and very poor households living in these areas.

Other characteristics of the target group include the following social indicators which are particularly gender unbalanced:

- Unemployment is very important amongst the target group, it reaches 23.5% on average but is 17.1% for men and 36.6% for women. This indicates the lack of opportunities locally for rural labour force.
- Illiteracy reaches 14.5% for men and 24.5% for women, compared to respectively 5.6% and 11.2% at national level.

Access to rural infrastructure varies. Access to drinking water and the network of rural roads is considered good. Although all poor villages are connected to the electricity network, power supply is unstable in the most remote ones where cuts are frequent. Finally, safe sewage networks are almost non-existent in all poverty pockets.

The recent study on livelihoods and gender analysis of the war damage in rural areas of Lebanon, commissioned by IFAD to FAO Investment Centre, collected detailed data on rural incomes in nine of the poorest ZAH (Homogeneous Agricultural Zones) of Lebanon (ZAH with

low UE ratios). The study found that in most of these ZAH (eight out of nine), the average income per capita is above the 'lower poverty line'. However, a significant percentage of the households interviewed are below the 'lower poverty line' (about 47% in the zone of Nabatieh, 40% in Akkar and 30% in South Lebanon – against a national average of only 8%), which confirms that rural poverty in remote areas is correlated with a low income potential from agriculture. On average in these nine ZAH, direct income from agriculture accounts for about 52% of total income (ranging from 26% to over 75% depending on the ZAH). Especially in the poorest categories of households, total income is positively correlated with the share of agricultural income, whereas the relative share of agricultural income decreases only in the highest income categories. This suggests that development of agriculture would be conducive to overall improvement in income especially for the poorest rural households and lifting them out of poverty.

The average annual income of the target group is estimated at USD 4,137 on the basis of the livelihood survey, which is close to the line of extreme poverty (USD 4,200 per year). Land resources are relatively scarce, with 12.0 dunum (1.1 ha) on average per family, but with only an estimated 2.98 dunum (25% of total as estimated from other sources) which are irrigated. Yet, agriculture constitutes the main source of incomes (54%) and therefore represents the major scope for increasing farm incomes, especially in view of the fact that three quarters of the land are not yet irrigated, which leaves good potential for improvement. A sample of such households have been surveyed and described in the "Livelihoods and gender analysis in poor rural areas in the wake of the 2006 conflict" undertaken by the FAO Investment Centre during 2007 on behalf of IFAD.

Focus Area Poverty and Agriculture Statistics

Descriptions	3 Project Focus Areas	Lebanon	3 Project Focus Areas as % of Lebanon
Total Area (in dunum)	3,178,489	10,452,000	30.4%
Number of Farm Households	59,221	194,828	30.4%
Poverty Incidence:			
Total No of Very Poor Households	7,150	15,586	45.9%
% of Very Poor Households	12.1%	8.0%	150.9%
Total No of Poor Households	16,740	39,940	41.9%
% of Poor Households	28.3%	20.5%	137.9%
Total Number of Poor and very Poor	23,890	55,525	43.0%
% of Poor and Very Poor	40.3%	28.5%	141.5%
Agricultural Area:			
- Total (in dunum)	709,346	2,479,401	28.6%
- per household (in dunum)	12.0	12.7	94.1%

Irrigated Area:			
- Total (in dunum)	176,865	1,040,084	17.0%
- as a % of agricultural area	24.9%	41.9%	59.4%
- per household	2.98	5.34	55.9%

The agricultural investments and exploitations in Lebanon are mostly small holders. The average farm size in the coastal zones varies between 0.25 to 0.75ha according to the caza. In Dannieh area and the south, the farm size varies between 0.1 to 0.75ha. Whereas in the Bekaa and Akkar these figures increase with farms with a size if more than 1ha.

The last agriculture census of 1999 provides approximate figures concerning the total number of farmers, the total surface of exploitations, the surface area under greenhouses and tunnels, and the number of heads of sheep and goat, as summarized in the table below:

Region	Number of Farmers	Surface of exploitations (ha)	of which Greenhouses in coastal zones (ha)	Heads of small ruminants
AKKAR	22,577	36,251	808 (mostly tunnels)	49,400
DANNIYEH	11,825	8,421	318 (mostly tunnels)	24,400
BCHARRI				8,900
BATROUN				4,800
SOUR	14,065	14,247	85	
BENT JBEIL	7,581	6,097		
MARJAYOUN	7,522	7,747		
HASBAYA	5,570	4,153		
BAALBACK	18,846	55,753		287,000
HERMEL	2,979	8,122		31,000
JBEIL			395	16,400
KESERWAN			212	16,500

(*) Dark and light colors (shades of grey) refer to areas totally or partially covered by the project, respectively.

The farmers' numbers are not sex-aggregated nor classified by type of agriculture activity within each region in any agriculture census or survey. However, a global figure on the national scale shows that females constitute 31% of the family workforce in the agriculture sector, and 18% from the hired permanent labour force. These percentages tend to increase with the size of the exploitation. On the other hand, the percentage of females increases to reach 50% for the seasonal hired labour force.

As for land tenure, most of the small holders exploit their own land, and recruit either permanent or seasonal labour force. While, in large farm exploitations, the land owners usually tend to rent the property to farmers for a determined period of years or on an annual basis. Most greenhouses on the coastal zone and many farms in the Bekaa and Akkar follow this type of land tenure.

It is to note that the Ministry of Agriculture is currently preparing a new National Agricultural

Census. Updated data from the census will be used to refine the project monitoring indicators and to prepare the project Annual Work Plans.

Gender issues

Within poverty pockets, the rising numbers of male migrants due to the adverse economic conditions are leading to a progressive “feminization” of the poor rural society. As also indicated by recent surveys, households consisting of widows with children are more likely to be poor, and are over-represented among the poor; and their share is five times their population share and eight times the corresponding share among better-off households.

Even though the educational field has witnessed great progress in relation to gender, unfortunately this has not been translated into the labour domain. Poverty has a gender profile, and it is very much related to the employment level and economic activity of the female population. Whereas 77.3% of the male economically active age groups participate in the labour force, only 21.7% of the female economically active age groups are employed, and this particularly applies to poverty pockets. The main reason for this discrepancy is cultural but it is also directly dependent on the low wages paid to women (50% of men's wages) which render married women economically incompetent to work, and is further aggravated in the workplace.

The study on “Livelihoods and Gender Analysis in poor rural areas in the wake of the 2006 conflict” had special focus regarding the division of labour and access to resources of women. The study revealed that only 3% of women have ownership rights to land. Land owned by women represents 8% of total land. About 25% to 40% of women are employed in the agricultural sector. These percentages are higher in the North compared to the South. Women are proportionately more involved in animal husbandry, cereal/ fodder and tobacco production. Their involvement in horticulture activities and olive orchards increases in the Southern region. At least 20% of the villages have a women's association or cooperative, in comparison to 80% of the villages hosting an association or a cooperative.

Particular attention will be given in the project to the application of a gender balanced approach in project activities. This would start with the final selection stage of beneficiaries, where an adequate number of women headed households corresponding to each local situation should be considered, and will continue during project implementation by checking that activities of present or potential interest to local women are designed and organized in such a way to also address and involve them.

Targeting and participation mechanism

The participatory approach will be a basic programming tool for the short, medium and long term development of the project area. The productive activities will be programmed as priorities to be implemented within the proposed project duration. However, these activities will be designed within a long-term vision in order to ensure that the appropriate institutional and community-based mechanisms are put in place to sustain the projects outputs and results. The involvement of all concerned institutional and local stakeholders is essential, not just for project formulation and appraisal but also for implementation, starting from the design and planning of the project activities.

The project will mobilize the local communities of the villages and select the beneficiaries through a transparent participatory process. Through this process the community identifies and plans a number of demand driven activities which enhance living conditions through improved productivity, strengthening gender equity, protecting the environment, and ensuring sustainability. The project will work closely with local representative bodies such as the Municipality Councils and/or Cooperatives. In Lebanon, the only legally recognized form of grouping is the cooperatives, which are under the mandate and supervision of the Cooperative General Directorate of the Ministry of Agriculture (MoA). The cooperative movement is very present in the

rural areas of Lebanon. Other informal agricultural groupings exist, such as the water rights users of the irrigation canals created under the Ottoman rulers in the Bekaa Valley (recognized by MOA and the Municipalities), which still play a fundamental role in irrigation water use and distribution. Special mention should also be made to the large number of Women Associations in all regions of Lebanon, often created around agro/food-processing activities promoted with the assistance of specific projects or NGOs. When working with small rural institutions, the project will ensure that 30% of their leadership are female.

The Participatory Approach for working with the targeted communities, Municipalities, cooperatives, farmers, and households, follows three steps which include (i) initial identifying and planning of activities (ii) organization/preparation of the beneficiaries; and (iii) implementation and empowerment of beneficiaries. The three steps involves as follows:

- Initial Identifying and Planning of Activities. The Municipalities/Cooperatives and the PMU will identify local committees to work with in the development of the criteria for the targeted farmers and households. Potential beneficiaries that fall under the criteria will submit requests to the PMU. This will be verified by the PMU through participatory rapid appraisal and then a basic and general participatory agreement for development will be agreed on. Following that a socio-economic and technical feasibility study will be prepared for every component.
- Organization and Preparation. This stage would include all activities to prepare both the farmers and the technical team for construction of the works and provision of services. The beneficiary farmers will be brought together and along with the PMU will start organizing and preparing for the implementation of project activities. At the same time, the physical infrastructure and design would be agreed upon with the appropriate contractors. Finally the farmer group will screen the design and a participatory agreement for the construction and the maintenance of project activities such as the water harvesting and irrigation schemes will be agreed upon.
- Implementation and Empowerment. This stage would include the construction of the infrastructure works, provision of services and the empowerment of the beneficiaries (institutions and farmers) to take charge of administrative and management responsibilities to operate and maintain the systems.

The proposed targeting mechanism is an on-going process throughout the course of the project. The project targeting mechanism has initially identified the regions with the highest incidence of rural poverty. The targeting mechanism then elaborates on the various steps and criteria in ensuring adequate group and individual targeting of the beneficiaries. It is designed to be transparent (i.e. based on widely shared and accepted criteria) and participatory: in other words, its implementation (the selection of beneficiaries) should not be imposed from top but negotiated with the communities on the basis of their knowledge and perception. Finally, again based on lessons learnt, its implementation should be carefully monitored throughout its implementation to ensure its adequacy and acceptance.

The MOA, GP and LARI will initiate the detailed design of their respective planned activities in the targeted areas as part of the initiation of the project. Then the PMU will engage in the above-mentioned participatory process at the local level to target specific communities and households. This will be largely undertaken at project start-up (first year), by applying eligibility criteria indicating income and poverty levels among others. In this respect, a major effort will be made within each concentration area to target the poorest villages and households while maintaining an equitable distribution among social groups. The poverty targeting process at community/household level will directly involve and mobilize representatives of institutions/organizations at municipal and local level, such as local authorities, key informants and representatives of the beneficiaries, organized in a local selection committee.

Poverty Screening Criteria: In this final poverty targeting phase, every effort will be made so that all project investments will be allocated to project beneficiary households based on participatory

rural appraisal process that will be coordinated by the PMU with the direct involvement of the municipalities, local authorities, and local communities. The local communities will be responsible for establishing the criteria for identifying the targeted vulnerable households based on the following:

- extent of poverty and vulnerability (income and alternative means of income);
- livelihood dependency on agriculture (agricultural income, residency in rural village, land size); and
- the vulnerability to climate change (direct and indirect material losses).

The PMU will ensure transparency and accountability in the process and selection. Based on the results of these screening criteria, the final list of beneficiary households will be finalized and validated by the local authorities after verifying their compliance (or willingness to comply) with the following eligibility conditions:

- availability of or accessibility to individual or collective cadastral land titles, land use certificates (issued by Mayors or Mukhtars) or leasing arrangements;
- commitment to participate in the feasibility studies of the site location and design works to be adopted;
- agree with the agreed cost-sharing arrangements of the Green Plan.

This approach is essential for ensuring transparency of the process with all concerned stakeholders, and is expected to contribute to control the risk of being undermined by local interests.

The following matrix describes how AgriCAL, based on the background study conducted, will ensure that the needs, capabilities, roles and knowledge resources of women and men are reflected. Beyond the measures included in the matrix, a feedback mechanism will be established allowing for continuous feedback from beneficiaries on project activities. It should be noted that the awareness of staff around gender issues and gender sensitive implementation is high with all staff members having received a dedicated training on this.

<u>Component:</u>	<u>Implementation modalities addressing needs, capabilities, roles and knowledge resources of women and men.</u>
<u>Component 1</u>	
<u>Output 1.1: Rainwater harvested from greenhouse roof tops</u>	<u>Some 30% of the beneficiaries of this component are female and that the incremental economic benefits generated through the demonstration will benefit the overall household income. Gender issues were included separately for the socio-economic baseline study conducted.</u>
<u>Output 1.3: Water efficient irrigation systems deployed</u>	<u>Small-scale institutions for water management usually include 30-40% of female community members in their management committees facilitating the implementation of activities in line with their needs, capabilities and knowledge. The project will ensure that the trainings for WUAs and water committees does not exclude women in line with the ESMP measures.</u>
<u>Component 2</u>	
<u>Output 2.1: Enhanced early warning system to farmers through improved existing system</u>	<u>Overall, the Lebanese IT sector is well-known in the region and fast growing. It employs a relative high number of women paving the way for an integrated gender sensitive model development. Women and men will both benefit from the dissemination of information through the early warning system. Women beneficiaries will be on the database for SMS.</u>
<u>Output 2.2: Expanded farmer outreach and ensured financial and management sustainability of the warning system</u>	<u>User testing and consultations will be organized with farmers (of both genders) allowing appropriate project design and implementation. Sensitization sessions (that will keep gender considerations into account) will be organized for mobile applications.</u>
<u>Output 2.3 Capacity building on adaptation techniques for vulnerable field crops enhanced</u>	<u>Gender sensitive implementation training methods are used (e.g. female only groups, the organization of activities close to the homestead) for the implementation of this activity.</u>
<u>Output 2.4 Guidelines and recommendations on agricultural adaptation techniques for vulnerable areas developed</u>	<u>To cater for the needs of both women and men, guidelines have been developed for a wide variety of crops and fruits where some of them</u>

<u>Output 2.5: Fodder resource assessment prepared</u>	<u>are traditionally cultivated by men and others by women.</u>
<u>Component 3</u>	
<u>Output 3.1: Community-based sustainable rangeland management plans prepared</u>	<u>The rangeland management development plan, specifically researched potential arising gender issues. Further to consultations, in order to make up for possible, income losses, medicinal plants will be distributed to women. Women will be the prime beneficiaries of income-generating activities under this component.</u>
<u>Output 3.2: Restored degraded rangeland areas</u>	
<u>Component 4</u>	
<u>Output 4.2 Policy advocacy activities implemented</u>	<u>Gender related policy engagement activities have been identified and connections with international agencies have been established allowing for gender sensitive policy engagement activities. A fair representation of women will be ensured in all knowledge sharing event.</u>
<u>Output 4.3 Knowledge management system established</u>	<u>Suitability for women as well as gender sensitivity is taking into account with the development of the KM system. Gender sensitive implementation methods (e.g. female only groups, the organization of activities close to the homestead) is foreseen for the implementation of this activity.</u>

PROJECT OBJECTIVES:

The overall goal of the project is to increase community resilience and adaptive capacity to climate change in Lebanon. The objective is to support the implementation of climate change adaptation measures in the agriculture sector in three highly vulnerable focus areas.

The programme will deliver this objective through four outcomes:

- Outcome 1: Increased water availability and efficient use through water harvesting and irrigation technologies
- Outcome 2: Increased adaptation to climate change for crop production
- Outcome 3: Increased resilience of shepherds and small ruminants to climate change through sustainable rangeland management
- Outcome 4: Policy influenced and lessons learned and shared through a knowledge management system

PROJECT 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.

Project components relate to the four main outcomes, and the outputs identified to achieve them. The outcomes deliver the programme objective, while the outputs are the deliverables produced by the activities. Details of outputs and activities and their rationale are provided in Part II, Section A, and the specific output budgets, summarized below. The results framework is presented in Part III, Section D.

PROJECT COMPONENTS	EXPECTED CONCRETE OUTPUTS	EXPECTED OUTCOMES	AMOUNT (US\$)
1. Water Management	<p>Output 1.1: Rainwater harvested from greenhouse roof tops</p> <p>Output 1.2: Improved access to climate-resilient water & Water efficient irrigation systems deployed</p>	Increased water availability and efficient use through water harvesting and irrigation technologies	1,920,000
2. Adaptation Techniques Roll-out	<p>Output 2.1: Enhanced early warning system to farmers through improved existing system</p> <p>Output 2.2: Expanded farmer outreach and ensured financial and management sustainability of the warning system</p> <p>Output 2.3: Capacity building on adaptation techniques for vulnerable field crops enhanced</p> <p>Output 2.4: Guidelines and recommendations on agricultural adaptation techniques for vulnerable areas developed</p> <p>Output 2.5: National fodder resource assessment prepared</p>	Increased adaptation to climate change for rangeland and crop production	1,012,800
3. Rangeland Management	<p>Output 3.1: Community-based sustainable rangeland management plan prepared</p> <p>Output 3.2: Restored degraded rangeland areas and reduced flood risks</p>	Increased resilience of shepherds and small ruminants to climate change through sustainable rangeland management	3,467,000
4. Policy and Knowledge Management	<p>Output 4.1 Policy and advocacy activities implemented</p> <p>Output 4.2 Knowledge management system established and knowledge management activities implemented</p>	Policy influenced and lessons learned and shared through a knowledge management system	157,000
5. Project/Programme Execution cost			688,200
6. Total Project/Programme Cost			7,245,000
7. Project Cycle Management Fee charged by the Implementing Entity (8.5%)			615,825
Amount of Financing Requested			7,860,825

Breakdown of Project Execution Cost

Item	Unit Cost (USD)	Units	Total (USD)
Office Rent	-	-	In-kind contribution
Project Coordinator	1,850	85	157,250
Administrative Officer	1500	21	30,917
Monitoring and evaluation and communication Officer	500	34	17,000
Accounting and Finance Officer	1,750	38	65,935
Procurement Officer (A)	1,000	38	38,450
Procurement Officer (B)	750	23	16,875
Technical Expert (Green Plan)	4,015	12	48,176
Technical Expert (LARI)	2,208	12	26,500
Technical Expert (MoA)	4,758	12	57,100
Audit	6,500	9	56,400
Operating Cost	8,000	5	42,888
IT equipment	35,028	1	35,028
Stationary and supplies	250	32	8,063
Travel to project field sites	500	84	42,087
International Travel	15,777	1	15,777
Car + Insurance + Maintenance	29,955	1	29,955
Total			688200

Project Cycle Management Fee charged by the Implementing Entity (8.5%) 615,825

Project Cycle Management Fee over 4y	% of 615,825	Amount
1. Development and Preparation	20%	123 165
2. Overall Coordination and Management	30%	184 747.5
3. Financial Management and Legal support	20%	123 165
4. Evaluation and Knowledge Management support including Reporting	20%	123 165
5. Overall Administration and support costs	10%	61 582.5
TOTAL	100%	615,825

Break-down of how implementing entity IE fees will be utilized in the supervision of the M&E function.

IE Fees Breakdown of M&E Supervision	Responsibility	Budget (USD)	Time Frame
Field Visits of Programme Monitoring Specialists	IFAD	18,000	bi-annually
Training workshops on M&E	IFAD	17,000	2013
Thematic Evaluations	IFAD	15,000	annually
Mid Term Evaluation	IFAD	30,000	2022
Final Evaluation	IFAD	30,000	2023
Knowledge management	IFAD	13,165	bi-annually
Total Indicative Cost	123,165	4 years	

DISBURSEMENT MATRIX

	1 st disbursement - Upon agreement signature	2 nd disbursement	3 rd disbursement	4 th disbursement	Total
Scheduled Date	30 Dec 12	15 April 2020	15 April 2022	2023	
Project Funds (USD)	1,464,700	2,231,100	2,629,836	919,364	7,245,000
Implementing Entity Fee (USD)	124,500	189,643	223,536	78,146	615,825

PROJECTED CALENDAR:

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

MILESTONES	EXPECTED DATES
Start of Project Implementation	2015
Project Closing	October 2023
Terminal Evaluation	April 2024

PART II: PROJECT 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.

OUTCOME 1: INCREASED WATER AVAILABILITY AND EFFICIENT USE THROUGH WATER HARVESTING AND IRRIGATION TECHNOLOGIES

Adaptation of the water sector to climate change involves technologies that tackle both increasing water availability and reducing the consumption through efficient water use. AgriCal project will provide the technical support needed for implementing proposed outputs. The first output is related to water harvesting new technologies, namely piloting 2 greenhouses that allow harvesting rain water and using it for irrigation purposes. This output is applicable in areas where precipitation is significant, greenhouses

The project will utilize new single-span greenhouses that are designed to accommodate for the adverse impacts of climate change and enhance the crops' quality and productivity, and will provide the system to harvest and collect rain water from the greenhouses.

The second output of Outcome 1 will connect 12 hill lakes that were constructed as part of the Hilly Areas Sustainable Agriculture Development Project (HASAD) project that closed in 2019, but was incomplete as the lakes were never connected to the farms. AgriCAL will construct the primary irrigation network for the 10 hill lakes in order for the water to reach the AgriCAL farmers while the other two hill lakes will be done by WFP based on AgriCAL's studies. . This will also include the deployment of new water efficient irrigation systems at the farm level. In addition, the project will provide technical support to monitor crop water needs for all vulnerable crops in the selected project areas. The Green Plan (GP) is the responsible entity to implement this outcome, given its historical

expertise in the construction of hill or earth lakes and water storage and distribution systems.

The project will follow the system of the Green Plan to implement the activities planned under outcome 1. The GP provides its support services on a demand driven basis with direct contribution from the benefiting farmers based on agreed upon selection criteria as well as standard financial rules and regulations. The GP funding mechanism requests the direct contribution of beneficiaries based on the following percentages:

Service/Product	Green Plan Contribution	Beneficiary Contribution
Greenhouses	75%	25%
Water storage reservoirs	Up to 50USD/m ³ of water	The remaining cost
Irrigation systems	65%	35%

The GP requires first the receipt of the contribution of the beneficiary before deploying its services or delivering its products. The GP can either provide in-kind contributions by providing its services (road and water storage units design and construction) or in cash (for the installation of irrigation systems).

This approach has been implemented by the GP for decades and has proved to be functioning in an efficient way with wide acceptance from farmers and local communities. Funding from AgriCal project will be delivered through this mechanism as part of GP contributions to the targeted communities. This modality will ensure the active participation of the farmers as they are committing their own resources and thus will enhance its sustainability. In addition, the cost-effectiveness of the project will increase.

The third output which deals with training farmers on programming their irrigation schedule and quantifying their water needs requires the involvement of other parties like, LARI and the extension service of the Ministry of Agriculture.

Output 1.1: Rainwater harvested from greenhouse roof tops (Rihane and Bentael)

Greenhouses, mostly located on the coastal areas do not usually benefit from traditional water harvesting techniques. Rainwater harvesting from greenhouse tops is a cost-effective technology that enables farmers to reduce their pumping from underground water and hence reduce the risk of sea intrusion and consequently avoid the salinity and depletion of groundwater and soil. Then energy saving from pumping will decrease GHG emissions and hence enable the contribution of this technology in mitigation efforts. This problem is mostly significant in late summer and autumn, where the water table is at its lower levels. This phenomenon is expected to amplify under future climate conditions. The use of collected water from greenhouse tops during that period will not only improve groundwater quality, but also enable the farmers to keep producing vegetables in autumn, under more expected drought conditions.

The original project design envisaged that 135, 5ha farms receive new Single Span Greenhouses (SSG) with 25,000 m³ of water stored for irrigation. The Ministry of Environment (MoE) consequently requested that the project not provide greenhouses to beneficiaries that already own them and instead conduct two greenhouse demonstrations with rooftop water harvesting to the farmers in the areas Rihane and Bentael to demonstrate the benefits of the technology. The proposed change will reduce the number of farms to two demonstrations (0.5ha) for a water saving of 800m³. It will also reduce the output budget from USD 662,500 to USD 106,000. The SSG was originally recommended worldwide for the advantages it has compared to the arched tunnel greenhouse, especially regarding the Integrated Production and Protection (IPP) and Integrated Pest Management (IPM). However in assessing the potential for greenhouses for rainwater harvesting, the project has found out that in the target areas (Rihane and Bentael), most if not all the beneficiaries already own SSG as well as the cheaper Arched Tunnel Greenhouses (ATG). The proposed demonstrations will aim to cover both SSG and ATG greenhouses, although due to the current economic situation it is expected that most farmers will opt for the ATG because it is much cheaper than the SSG. The MoE prefers to keep both

options open for the framers in order not to put additional financial pressure on them. Nevertheless, the benefits of the SSG will be strongly highlighted and recommended to those who can afford them.

Two pilots using existing greenhouses will be used to introduce the rooftop water harvest concept in the area of Rihane and Bentaël and will be equipped with a collection system to harvest rainwater. The sustainability of these two pilots is guaranteed through a maintenance, free viewing access to other farmers, and non-removal contract between the two farmers and MoE. The areas of Rihane and Bentaël are targeted to enable the simulation of different circumstances faced by farmers in the coastal areas and mid-altitude highlands. There are clear incentives for operation and maintenance for the two farmers and thus high sustainability prospects because the institutional set-up is simple with no collective action required. The project will also pursue a written memorandum of understanding with the two farmers to formalize operation and maintenance arrangements and guarantee a minimum period (e.g. 5 years) for demonstration to other farmers and time slots of being open to other farmers.

In addition, farmers with the support of the AgriCAL will procure and construct the reservoirs to store the harvested water. The water storage reservoirs could be a hill lake, a cement reservoir or ready-made tanks. These pilots will be used as demonstrations in the wider Byblos area (excluding the cultural heritage sites) as farmers in the area already have SSGs and ATGs. These pilots are upon request by the Ministry of Environment to inform the ministry and the farmers on the feasibility and scalability of greenhouse water harvesting model in the targeted areas. Favorable results of the pilot are expected to lead to the upscaling by the Ministry of Environment and the Green Plan.

Activities:

- Assessing potential greenhouses for rain harvesting in Byblos
- Promoting the technique to farmers and ensuring their involvement in the project
- Preparing the design and BOQs (for 0.5ha)
- Training farmers on maintaining their system

Output 1.2: Rainwater harvested from roads

(Cancelled)

In output 1.2 it was originally planned for the project to introduce water harvesting along the roads constructed by Green Plan with the objective to supply 120, 10ha farms with 50,000m³ of harvested rainwater. As part of the planned assessment as per the project document activities, it was however realised that the target area does not have a suitable location for collecting the harvested water. The Green Plan team searched and investigated over all the executed roads by the department of road and water without finding a suitable site or location close to the roads where a hill lake or large tanks can be built to store the harvested water within servicing distance of potential beneficiaries. The activity was deemed to be not economically feasible and is proposed to be cancelled in favour of the former output 1.3, now 1.2 below.

Output 1.2: Improved access to climate-resilient water resources & Water efficient irrigation systems deployed

At project design, the aim was to increase water availability for 150ha of farmland that were to be supplied with water for climate-resilient irrigation from the water harvesting Hill Lakes developed under the IFAD project Hilly Areas Sustainable Agriculture Development Project (HASAD). AgriCAL was meant to have promoted different technologies including the possibility to improve the efficient use of water through the deployment of water-efficient irrigation systems, to shift irrigation practices from surface to drip irrigation. In 2019 the HASAD project was completed and 12 hill lakes were established with a capacity to collect 479,000 m³ of rainwater. While HASAD constructed the 12 hill lakes, the project was only partly successful as the hill lakes have not been connected to the main irrigation networks as planned. Accordingly, in addition to providing efficient irrigation systems, the proposed changes by the project would be to ensure access by the AgriCAL beneficiaries to the water available in the Hill Lakes developed under the HASAD project. To achieve this it is proposed that

AgriCAL would construct 27.1km of irrigation network for 10 of these hill lakes in order for the water to reach the farmers living in the surrounding areas, taking into consideration that the remaining two networks have been successfully constructed by the World Food Programme (WFP) in early 2021. As a result of the output revision, AgriCAL will ensure that 262 hectares, comprising 698 farms, will be made climate-resilient. The Hill Lakes, volume of water and length of network to be constructed by AgriCAL and WFP are shown in table 1 below. The addition of the construction of the primary networks of the 10 hill lakes by AgriCAL increased the output budget from USD 426,000 to USD 1,814,000. To address sustainability concerns around the water networks, Green Plan will provide institutional capacity development including technical capacity building and support to the water committees and Water User Associations (WUAs). The project will also cooperate with relevant municipalities and WUAs to agree on the fee to be charged to the beneficiaries for the provision of the irrigation service to ensure proper operation and maintenance of the networks. This will ensure the sustainability of this sub-component.

Increasing water availability through different technologies is also an opportunity to improve water efficient use through the deployment of suitable irrigation systems. AgriCAL will deploy water efficient systems for all 698 beneficiaries benefiting from the 12 primary networks constructed by both WFP and the project. Although most targeted beneficiaries already have such drip irrigation systems in place, the recent assessment conducted by the project revealed that the majority are not functioning and in need of upgrading and maintenance. The project will provide each beneficiary with a system that covers 2.5 donum (i.e. 0.25ha) which in turn will increase the initial total area from 150ha to 174.5ha benefiting from **on-farm** efficient irrigation systems. As most of the initiatives are in areas where farmers grow fruit trees and vegetables, drip irrigation system and its variances is the most appropriate to introduce. Shifting from surface irrigation to drip irrigation where water is directly delivered to the root zone reduces drastically evaporation and percolation losses. This system reduces also energy and labour needed for soil preparation and weed control. The increased stored water from hill lakes or other techniques through AgriCal project would enable the deployment of drip irrigation system for about 262ha of vegetables and fruit orchards. The deployment of drip irrigation system *per se* is not enough to ensure maximal water efficient use. Farmers will be trained by MOA extension service on maintaining their water harvesting and distribution network as well as their irrigation systems. The training will also enable them linking water consumption to plant requirement and climate demand. The programming of irrigation and its quantities will consequently amplify the plant resilience and farmers readiness to climate variability. The reduction of plowing activities for land preparation and weed control will contribute to mitigation efforts as less GHG emissions are expected.

#	Hill Lake name	Volume (m ³)	Length of network (km)
AF / AgriCAL			
1.	Ehmej	30,000	2.4
2.	Beit Lif	28,000	1.8
3.	Ain Bnayeh	30,000	1.5
4.	Menjez	46,000	3.9
5.	Kfarchouba	45,000	2.7
6.	Barqua	40,000	2.97
7.	Zrazir	45,000	4.2
8.	Kernayel	20,000	1.5
9.	Deir El Mkhales	55,000	3.5
10.	Kaikab	67,000	2.63
Total AgriCAL		406,000	27.1
World Food Programme (WFP)			
11	Nahle	20,000	3.45
12	Medwe	53,000	2.35
Total WFP		73,000	5.8
Grand Total		479,000	32.9

Activities:

- Assessing the BOQ according to the number of beneficiaries, cropping patterns and irrigated area
- Promoting the technique to farmers and ensuring their involvement in the project
- Procuring the equipment, and installation (for 174.5ha)²
- Construction of 32.9km of irrigation network connecting the hill lakes with (connecting 262ha of farms to water harvesting reservoirs)
- Training farmers on programming and planning their irrigation schedules and quantities and on maintenance of the irrigation system

OUTCOME 2: INCREASED ADAPTATION TO CLIMATE CHANGE FOR CROP PRODUCTION

Readiness to climate change embeds an increased knowledge on the impact variability under climate uncertainty. It is enhanced by acquiring multiple tools that enables assessing vulnerability, evaluating the foreseen impact and providing adaptation means. This outcome has five outputs that deliver several techniques including early warning systems, integrated production and protection of the crops, introducing adapted crop varieties to future climate conditions, introducing risk-coping agriculture techniques, as well as assessing the carrying capacity of rangeland in order to increase their resilience to climate change. Selected vulnerable areas depending on rangeland and crop types will be defined for pilot demonstration

150ha are expected to be irrigated from the HASAD hill lakes plots. This outcome will be implemented by the Lebanese Agriculture Research Institute (LARI) given its expertise in the suggested technologies.

Output 2.1: Enhanced early warning system to farmers through improved existing system

The early warning system based at LARI relies on the 60 deployed weather stations into different parts over the country. The original design envisaged that additional weather stations are needed to complete the coverage of the project area as follows: Baalbeck-Hermel: 3 stations; Akkar: 1; and Southern Litani: 3 stations. However, LARI's current assessment revealed that more stations are needed in the project area as follows: Naqoura: 1 station; Tebnine: 1 station; MarjAyoune: 1 station; Damour: 1 station; Beskinta: 1 station; Bikfaya: 1 station; Qartaba: 1 station; Bentael: 1 station; Batroun: 1 station; 1 Aarsal: 1 station; Yamoune: 1 station; Chaat: 1 station. Taking this into consideration the output budget was increased from USD 190,000 to USD 375,000.

LARI is currently providing early warning system service (EWS) to more than 49,000 farmers, mostly in the Bekaa and Akkar regions. Following the forecast provided by the different weather stations of the institute, the generated data analysis by LARI researchers enables sending short text messages to all subscribed farmers. Two models for assessing the risk of potato late blight in Akkar plain and apple scab in Akkar heights are already functional. Farmers are notified through text messages, and through the existing extension service and technicians of LARI, the Ministry of Agriculture and NGOs present in the area. These messages include:

- Weather forecast for the coming week
- Specific recommendations for growers (of concerned crops) for irrigation monitoring (i.e. wheat growers are urged to irrigate their fields next week).
- Specific recommendations for growers in a defined area to conduct a preventive or curative spraying against a certain pest, suggesting the active ingredients to be used (i.e. table grape growers in Bednayeel-Baalbek should spray next week against grape worms).
- Recommendations about eventual other field practices to be performed (tillage, pruning, plantation) whenever linked with climatic conditions and weather forecast.
- Information about eventual distribution of a certain pesticide for farmers at LARI stations.

Most farmers usually appreciate these messages, and follow them. An increasing demand for this service is noticed among farmers. AgriCal project will support LARI in expanding this service to reach more farmers in the target areas and enhance the analysis of climate information to provide better guidance. To achieve this the AgriCAL project will develop a smartphone application that will enable farmers to access detailed information provided by the EWS. The cost of this application was also a factor in the increase of the output budget.

This output aims at replicating this exercise to a maximum number of pest outbreaks that are linked to climate variability (fire blight, mildew, wheat rust...) as well as water demand estimation according to climate demand and cropping pattern and enlarging the number of beneficiaries and covered area (Akkar, Danniyeh, Hermel, Baalbeck, and southern Lebanon which are amongst the most vulnerable to climate change are prioritized). Early warning system delivering timely recommendations for an integrated pest management will reduce the number of sprays, and consequently not only reduce the cost of production, but also ensure better quality of production with less GHG emissions. The target crops will be wheat, barley, potato, tomato, cucumber, apple, pear, peach, cherry, apricot, grapevine, olive, banana and almond which are widely produced in the focus areas.

Activities:

- Assessing the needs and gaps in the existing system, according to cropping pattern and diseases in the targeted areas (Akkar, Danniyeh, Hermel, Baalbeck, and southern Lebanon)
- Procuring and installing 12 weather stations and linkage with network
- Installing the software and modeling programmes to enhance existing early warning system
- Linking early warning system to irrigation practices and cropping patterns, as well as integrated pest management.

Output 2.2: Expanded farmer outreach and ensured financial and management sustainability of the warning system

This output will ensure the sustainability of the service through proposing the most appropriate financial mechanism to the warning system. It involves different parties including public and private sector actors. The financial sustainability of the system will enable up-scaling it to all farmers nationwide. The AgriCAL project was successful in driving a Public Private Partnership (PPP) between LARI and Debbane Company which is the local agent of Pessl, the manufacturer of the weather stations currently used by LARI all over the country. Debbane will provide LARI with Agrometeorological services at a fraction of the cost for 5 years in return for advertising rights in the EWS smartphone application. This agreement will ensure sustainability of the EWS for at least the coming 5 year, if not longer, in the event of the renewal of the agreement by both parties. The success of the PPP reduced the cost of this output from USD 100,000 to USD 25,000. The USD 25,000 is dedicated to a consultant who will develop a comprehensive private sector strategy that will ensure sustainability and further partnership with other interested private sector entities. To date LARI has 49,000 farmers registered on their website to receive early warnings through SMS. The AgriCAL project will enhance this service through developing a mobile app that is user friendly, will provide more comprehensive warnings, and access to metrological data. LARI expects an increase in EWS users by at least 11,000 until project end a direct results of the mobile app. Finally, communication needs will be identified and feedback response are provided to farmers in a gender sensitives method. The World Metrological Organization considers that an early water warning messages system should allow to (i) detect, monitor and forecast hazards; (ii) analyse risks of the involved; (iii) disseminate timely warnings and (iv) activate emergency plans to prepare and respond. Agrical will use existing contact moments between the project and beneficiaries in order to disseminate information on the early warning system such as the capacity building moments on adaptation

techniques and through the water user associations taking into consideration gender dynamics.

Activities:

- Assessing the managerial and technical capacity needs of LARI to operate and maintain the early warning system and provide the technical support needed to LARI staff.
- Developing financing mechanism that includes the private sector to ensure sustainability of the system.
- Identifying communication needs and upgrade existing information dissemination system and feedback response from farmers.

Output 2.3: Capacity building on adaptation techniques for vulnerable field crops enhanced

Rain fed field crops (*wheat, barley, chickpeas, lentils, etc.*) are amongst the most vulnerable crops to climate change. Several technologies are harnessed to risk coping, including the introduction of adapted selected varieties, supplementary irrigation and irrigation management, integrated pest management, no-till and crop rotation practices and so forth. Since LARI is already studying these techniques, and reproducing new cultivars of legumes and cereals for dissemination to farmers, it is important to increase farmers' capacity on how to grow new varieties under climate uncertainty. This outcome will increase the resilience of farmers, namely in the major producing areas for cereals and legumes, through the creation of demonstration plots where all the adaptation techniques are realized in one package. This approach will amplify the adaptation mechanism and increase farmers' acceptance to the introduced technologies. The original design targeted areas producing cereals and legumes: namely Bekaa, Marjayoun and Akkar regions. The adoption of adaptation techniques simultaneously will have a positive impact on the reduction of energy for plowing and spraying, and consequently enhance mitigation by reducing CO₂ emissions. The approach of demonstration plots for MOA and NGOs technicians, as well as farmers will be the most appropriate tool to promote the up-scaling of the use of these technologies for cereal and legume growers. Both Bekaa and Akkar are still targeted by the project while Marjayoun was excluded at start of implementation. This is due to the fact that it would need more than 20 weather stations in place in order for implementation to commence. The fact that this number of stations does not exist in the area makes it impossible to implement the activities under this output. The exclusion of Marjayoun reduced the output budget from USD 250,000 to USD 180,000.

Activities:

- Preparing the capacity building programme, including on-site demonstration and farming equipment, to harness LARI concerned departments with the potential farmers for the implementation of demonstration plots.
- Selecting the demonstration plots within the three focus areas.
- Implementing activities within the plots including the proposed adaptation measures: the introduction of adapted cultivars, no-till practices, crop rotation, supplementary irrigation techniques, soil fertility management and integrated pest management.
- Disseminating and promoting the results through on-site observation and demonstration, field trips, etc.

Output 2.4: Guidelines and recommendations on agricultural adaptation techniques for vulnerable areas developed

In output 2.3 all the adaptation techniques are delivered in one package in every demonstration plot only on cereal and fodder crops. In this output, adaptation measures are applied only when necessary, depending on the crop vulnerability in every agro-climatic zone, and the type of climate change impact on this crop. Several irrigated or rainfed crops are vulnerable to climate

change. Nevertheless, the impact of climate is not only due to lack of precipitation or water for irrigation. Some crops will experience a lack in chilling hours, while others will suffer from excessive heat or a reduction in the vegetative season. Many crops will be indirectly affected by the increase of pest and disease outbreaks due to increased variability in climate or the decrease in water availability for irrigation. The amplitude of climate impact will also vary from one region to another. Hence, according to the crop and the type of impact an adaptation measure a series of measures are recommended. According to the cropping pattern within each agro-climatic zone in the country and to the expected impact under uncertainty, adaptation techniques will be proposed and disseminated to technicians (including the MOA extension service, NGOs, etc.) and key farmers (those who usually are pioneer in developing new practices in their exploitations). Since these techniques are in most cases easy to deploy, the farmers will adopt them spontaneously when aware. Moreover, the MOA and NGOs will promote these techniques by providing them in kind to the farmers (i.e. new varieties adapted to climate variability), or through specific projects, enabling the up-scaling of their use (Conservation agriculture, IPM, etc.). Some of the techniques, like Integrated Pest Management, good agriculture practices and no-till are also means for mitigation, as less GHG emissions will result from their application. The original design envisaged that external experts will be needed to develop these guidelines. However, LARI experts took the lead on developing these guidelines which reduced the cost significantly, taking into consideration that the majority of them are already receiving incentives for their work on other related outputs of this component. This proposed implementation modality reduced the output budget from USD 400,000 to USD 67,000.

Activities:

- Assessing impact type according to the cropping pattern in each agro-climatic zone in the three focus areas.
- Identifying the most suitable adaptation techniques targeting vulnerable crops in the in the focus areas to improve productivity.
- Implementing the techniques in demonstration plots distributed within the three focus areas.
- Preparing technical guidelines and recommendations and disseminating them to technicians and key farmers.

Output 2.5: National fodder resource assessment prepared

Rangelands in Mediterranean ecosystems include natural seasonal pastures, abandoned or post-harvest agriculture land, forests and scrublands. Hence their nutritional value and consequently carrying capacity are variable. To be able to conduct a sustainable rangeland management plan under current or future climate conditions, it is important to assess the distribution, abundance and nutritional value of fodder species into the different types of rangeland. For this purpose a national fodder resources assessment (NFRA) is needed. A first initiative on agro-biodiversity has been implemented by LARI. The collaboration of LARI with Kew Garden, ICARDA and ACSAD increases its assets in driving in the necessary expertise to conduct this assessment. Since the inventory of fodder species is a national necessity, sampling design representing all types of rangeland is needed. Laboratory analysis is required to evaluate the crude protein, crude fiber, digestible fiber, ash and other components in order to evaluate the nutritional value of forage, and consequently the carrying capacity of the rangeland. Field surveys to better understand herds movement, range access and land tenure as well as shepherds livelihood will be also conducted. Mapping rangeland, their characteristics and their vulnerability to climate change will be the end result of this output. This output will be an essential step towards the implementation of outcome 3 related to rangeland management. This output is conducted in Mount Lebanon, Anti-Lebanon, and the whole Bekaa valley including the Nabatia region. These areas fully represent the 4 habitat zones of rangelands in Lebanon allowing the assessment to be generalized nationally. Since the time of the original design LARI and MOA have been able to develop their internal capacity to fully conduct this assessment. LARI and MOA experts will be contracted to conduct the assessment at a

lower cost than the originally estimated cost. Laboratory and field equipment necessary to conduct the assessment will also be procured for LARI by AgriCAL, this modification will ensure that the original output is implemented, in addition to the added value of building the capacity of local institutions (i.e. LARI). Through this arrangement the output budget is reduced from USD 860,000 to USD 365,800.

Activities:

- Forming of a multi-disciplinary team from LARI and MOA
- Preparing the methodology, the sampling design and field manual
- Procurement of maps and materials.
- Preparing and completing field questionnaires.
- Training of the staff implicated.
- Implementing field survey of vegetation, impact of grazing and ground truthing of satellite data.
- Compiling rangeland survey maps (GIS based) and vegetation data sets
- Analysis of rangeland data and recommendations for the pasture management plan.
- Producing and disseminating NFRA report with analysis of the results.
- Developing a web-based information system

OUTCOME 3: INCREASED RESILIENCE OF SHEPHERDS AND SMALL RUMINANTS TO CLIMATE CHANGE THROUGH SUSTAINABLE RANGELAND MANAGEMENT

Herds of goat and sheep move into the different types of rangeland and graze almost all year round. Therefore, they depend quasi-totally on natural ecosystems and are vulnerable to climate change. The direct impact would be severe reduction in both milk and meat production. Mountain tops in both Mount Lebanon and Anti-Lebanon chains as well as the northern Bekaa valley are particularly exposed. The harsh degradation of vegetation cover into these arid and semi-arid zones increased the occurrence of flash floods in the area, with severe damage to farmers. Rangeland resources, which in most cases are communal or public properties, are crucial for the livelihood of the rural communities.

This outcome will ensure the technical support needed for implementing a pilot management plan within the mentioned area, along with two outputs enabling sustainable management of rangeland, increasing the resilience of shepherds with their families and herds to climate extremes, protecting the watersheds from further degradation and reducing flash floods in selected valleys in Baalback-Hermel areas. Communities relying on rangeland production in the three focus areas will be the main beneficiaries. The dissemination of the results of this output will ensure the adoption of appropriate management plans for rangelands which account 50% of the surface of the country, and ensure fodder for more than 1,000,000 ruminants. Sustainable management of communal rangeland will provide stable revenues for municipalities and increase consequently the resilience of local communities to climate change.

The restoration of 2 degraded watersheds through plantation of forest and fodder species will not only reduce the impact of erosion and flash floods, but also improve rangeland and involve the local communities in watershed management.

Output 3.1: Community-based sustainable rangeland management plan prepared

The selection of the pilot area will be a result of the national fodder resources assessment. During the consultative process among the different parties, a large area including mountain tops of northern Mount Lebanon (Akkar, Danniyeh, Bcharri, Batroun, Jbeil and Keserwan heights) and Anti-Lebanon, with the Bekaa valley (Baalback, Hermel, West Bekaa and Rachaya) is suggested. The surface area is about 3000Km² and represents 30% of the total

area of the country. Activities will include the assessment of livestock status, animal husbandry and milk storage practices and the needs to improve the current situation towards a more resilient status. Furthermore, an administrative managerial scheme is suggested to the responsible department on rangeland within MoA, namely, the Directorate of Rural Development and Natural Resources (DRDNR), to ensure legislative coherence as well as convergence between the targeted shepherds and the rangeland owners (municipalities, etc.). The technical staff of the DRDNR will be trained to implement sustainable rangeland management plans. The managerial scheme will be elaborated in the light of ensuring the involvement of the local communities in the rangeland management plans, which should result from community-based decisions..

The project will implement in the selected area activities related to enriching pastures with native forage species, capacity building for herders to undertake animal husbandry good practices, monitor herd transhumance and distribution, empower women to produce different dairy products and better milk storage, increase the product added-value and marketing opportunities, and consequently increase the resilience of rural women and households. Such activities would compensate herders for not accessing protected/degraded pastures and would enable monitoring milk production (as an optimal indicator for range and livelihood improvement and assess the impact of climate change). The adoption of a managerial mechanism by DRDNR as well as the local communities, the size of the pilot area and the presence of key actors including the largest livestock of the country and the largest communal rangelands will facilitate up-scaling this output. The recovery of pastures in these rangelands will contribute to carbon sequestration and consequently increase mitigation.

A thorough assessment by the MoA revealed that the targeted area needs to be limited due to the fact that the beneficiaries will require various types of support in order to achieve the objective of this output. Firstly, the optimal areas to implement this output were determined to be Nabatia and Balabak because they are the only two areas where no studies were conducted in before. The study and management plan will be conducted for both areas, however, it will only be implemented in Nabatia because costs of the needed support have increased substantially since the design of the project. Furthermore, the field assessment indicated that in order for the rangelands to recover, beneficiaries must stop grazing for at least one season. Accordingly, considerable fodder amounts will be provided to the beneficiaries in order to stop grazing for the required period of time. Other alternative income-generating support such as bee keeping and aromatic herbs is also needed to support the beneficiaries through the period of non-grazing. Quality enhancement of dairy production is also necessary for achieving the objective of this output as was initially envisaged by the original design. Therefore different types of trainings and equipment will be provided for beneficiaries to improve the quality of their production. Taking all of the above into consideration, this output budget needed to be increased from USD 580,000 to USD 776,000.

Activities:

- Assessing and selecting the project targeted areas.
- Designing and undertaking a participatory approach with the local users of rangelands and production of local management plans
- Developing rangeland use maps per selected area
- Training local communities and DRDNR staff on the implementation and monitoring of the rangeland management plans.
- Enhancing the capacity of herders and women groups within the selected pilot area on sustainable rangeland management practices.
- Providing on-the-job training on animal husbandry good practices.
- Providing on-the-job training for women on dairy processing and provision of needed equipment (cheese presses, milk storage units, etc.).

- Supporting income diversification for small livestock holders to reduce pressure on rangeland
- Facilitating linkages between local producers and the relevant distribution and market facilities to support the implementation of the rangeland management plans.

Output 3.2: Restored degraded rangeland areas and reduced flood risks (Faara and Al-Qaa)

Degraded rangeland areas on the mountain slopes of watersheds leading to the Bekaa valley have been historically suffering from flash floods. More attention has been given to watersheds in Ras Baalback and Aarssal. Nevertheless, there are 13 remaining valleys which necessitate management of streams to reduce the impact of floods. This output will focus on the rehabilitation of two watersheds Al-Qaa watershed and the surrounding area in Baalbak caza and Wadi Al-Karem, Dabour and the surrounding areas in Hermel (i.e. Faara) covering 366 km². In the original design it was envisaged that activities under this output are not only meant to reduce the impact of floods, but rather restore the vegetation of the degraded upper water-catchments in order to increase water infiltration and reduce surface runoff. This would buffer the adverse effects of climate extremes and enhance coping of the rangeland ecosystem to climate change. However, the MoA advised the project that the most urgent and most substantial need is in flood reduction. The MoA also committed to implementing the plantation upon completion of the flood control measures/structures. The MoA also advised that the inclusion of Al-Qaa water shed was necessary since it became increasingly more dangerous, in addition to the fact that based Nahle has already been constructed by the MoA. Moreover, the inclusion of Al-Qaa increased the project's total coverage of the flood control intervention from 166 km to 366 km. Once the nurseryies isare producing, plantation efforts within 3 years on at least 2300ha (2000ha restored with fodder species and 300ha with forest species) of degraded rangelands in the selected pilot area will reduce further deterioration of vegetation cover and prevent erosion. The original design of the project targeted Deir el Ahmar and Kfar Dan nurseries, however the MoA has already rehabilitated both sites. For this reason, the MoA recommended that the project rehabilitate the Abdeh nursery which will produce more than four times of seedlings compared to the previously targeted two nurseries. The proposed increase of the flood control area, by more than double, resulted in the increase of the out budget from USD 1,970,000 to USD 2,691,000.

Activities:

- Elaborating site specific implementation plans, design and BOQ for rangeland restoration and flood risk reduction
- Installation in watersheds of 9 hafeers (270,000 m³), stone check dams (9600 m³), and gabions (1300 m³) and contour line walls (15,000 linear meter)
- Designing and rehabilitating 1 MoA ~~nurseries-nursery~~ (Abdeh) for the production of fodder species and aromatic species.
- Training concerned staff for fodder species identification, harvesting seeds, and multiplication and plantation techniques.
- Harvesting of fodder species seeds for further multiplication in LARI/MoA experimental units and nurseries.
- Protecting degraded rangeland through the issuance of laws and regulations and law enforcement with measures addressing alternative grazing areas for shepherds, following the rangeland management plan resulting from output 3.1
- Reseeding with fodder species (examine the possibility of using medicago, salsola, atriplex, etc) at least 2000 ha for water and soil conservation in the 2 watersheds
- Plantation of tree species (Cupressus sempervirens, Pinus brutia, Quercus calliprinos, Pistacia palaestina) over at least 1500 ha
- Reseeding with fodder species (examine the possibility of using medicago, salsola, atriplex, etc) at least 2000 ha for water and soil conservation in the 2 watersheds

OUTCOME 4: Policy influenced and lessons learned and shared through a knowledge management system

This component will support the implementation of a knowledge management system to capture and disseminate lessons learned throughout the project implementation phase.

Weather stations should enable assessing the risk of the occurrences of extreme adverse climate conditions.

The Government of Lebanon is actively preparing a number of national and sectoral policies and strategies aiming at reaching sustainable development and achieving the Millennium Development Goals. Environmental management, including adaptation to climate change, is of high relevance to several strategies and policies.

The project will design tailored awareness and advocacy activities using multiple media and routes to reach out to the different stakeholders. The activities will be targeted to farmers, extension workers, relevant private sector entities, decision makers and public institutions at the national and local levels across Lebanon.

Since AgriCAL is the first project focusing merely on adaptation to climate change in Lebanon, it is fundamental to ensure proper compilation and dissemination of lessons learned, experiences gained in the field, and knowledge acquired.

Access to good information and knowledge is paramount to the success of processes at the national and local levels. Supporting learning, innovation, and application of what is already known, is fundamental to progress towards more sustainable management of the agricultural sector and climate change adaptation.

The project will design and implement a knowledge management system tied to organizational objectives and is intended to achieve the planned outcomes. The knowledge base comprises: (i) expertise, skills, and research results; (ii) facts and information, reports on project impacts and activities, and other data; (iii) awareness or familiarity gained by experience of a fact or situation acquired through the project.

Output 4.1 Climate index-based insurance initiated (Cancelled)

Output 4.1 of the original project document included the piloting of a climate index-based insurance however during the initial assessment, the feasibility of the activity was questioned for a number of reasons. Primarily that the required meteorological infrastructure on the farmers lands do not currently exist which makes the piloting of the climate-based insurance not feasible. Additionally historical meteorological data is not available on selected crops within the same region to assess weather patterns and impact for comparative purposes. Ultimately it was also assessed that insurance companies would need to be willing to engage with and insure farmers, which was not the case. Despite the Ministry of Agriculture having made a number of unsuccessful attempts to develop such an insurance pilot upon request of AgriCAL, in absence of the required preconditions it is recommended that this activity be cancelled. Keeping this in mind, the overall component 4 budget was reduced from USD 580,000 to USD 157,000. **Output 4.1 Policy advocacy activities implemented**

This output will extend over the life time of the project and will highlight the impact of climate change on natural resources and agricultural development in Lebanon, and the responsibility of the different actors in adapting to climate change impacts through the issuance and implementation of relevant policies, plans, and programmes.

Activities:

- Conducting regular policy advocacy activities throughout the life of the programme, including at relevant national and regional events.
- Organizing a national forum to review and integrate climate risk reduction strategies and measures in the relevant national and regional development plans.
- Supporting mainstreaming of climate risk reduction measures into the policies, regulations and annual regional and national capital budgets.
- Providing technical support to the climate change unit at the Ministry of Environment.

Output 4.2 Knowledge management system established and knowledge management activities implemented

This output focuses on establishing the knowledge management system and ensuring that all the requirements for its effective functioning are put in place.

Activities:

- Designing and establishing a knowledge management system for the project.
- Developing appropriate knowledge products, including photo stories, presentations and briefing notes, etc. for use in policy advocacy activities.
- Disseminating knowledge products, targeting outlets that are relevant for policy makers
- Conducting a study tours to the project areas to enable sharing between stakeholders, farmers, and local communities.
- Producing audio-visual material describing the projects' products and results.
- Ensuring good media coverage for programme activities.

B. Describe how the project / programme provides economic, social and environmental benefits, with particular reference to the most vulnerable communities.

The main expected benefits would consist of increased community resilience and adaptive capacity to climate change in three highly vulnerable focus areas.

Irrigated crops in the project focus areas are mostly high value fruits and vegetables. These crops are marketed by producers for cash purposes and destined to both internal and international markets. In good conditions, they largely contribute to the farmers' cash income. The project focus area includes as well the largest rangeland area of the country with significant livestock of sheep and goat. The predicted climate change scenarios for Lebanon will jeopardize the performance of these crops (yields, quality and therefore selling prices) and small ruminants relying on rangelands. The project aims at supporting local communities in enhancing their adaptive capacity to climate change through:

- a. Increasing quantity of reliable water supply through ~~construction of~~connecting water harvesting structures, irrigation facilities and improved water management. This is considered the key factor contributing to increased productivity.
- b. Enhancing capacity for assessing vulnerability, evaluating the foreseen impact and providing adaptation means by that delivering several techniques including early warning systems, integrated production and protection of crops, introducing adapted crop varieties and risk-coping agriculture techniques, as well as assessing the carrying capacity of rangeland.
- c. Increasing the resilience of shepherds and herds to climate extremes through

implementing rangeland sustainable management plan, ii) training herders on good animal husbandry practices and dairy processing, iii) reducing flash floods through the installation of suitable infrastructure, iv) protecting the watersheds from further degradation, through vegetation cover restoration by planting fodder species shrubs and trees and conducting protective measures.

- d. Influencing policy through advocacy activities and implementing a knowledge management system to capture and disseminate lessons learned throughout the project.

Other benefits such as institutional strengthening have are substantial positive impact on the long run. In particular, the local stakeholders participating in the project would see their technical skills, knowledge, and capacities improved. At another level, the Ministry of Agriculture, Green Plan, and LARI would see their capacities enhanced, their respective field presence and partnership strengthened and their procedures improved.

Women will targeted specifically by AgriCAL using appropriate targeting mechanisms. Women will be the main beneficiaries of the income generating activities component allowing them to be economically empowered. The voice of women in rural institutions will be increased by including them in small scale organizations such as water user associations. Improving the access to water at household level could increase support women with their domestic chores and reduce their overall workload. Youth shall benefit from additional employment opportunities generated by the overall increased resilience of the agricultural sector to climate change. Especially given the economic meltdown, the agricultural sector regained importance as a potential employer for young people who initially decided to migrate to urban areas.

Marginalized groups will benefit both directly (e.g. main stakeholders, as consumers, community members) and indirectly (e.g. as stakeholders in the value chain) from project interventions. Shepherds have been identified as a main vulnerable group historically faced with exclusion from regular communities and limited access to social empowerment and economic opportunities. Rangeland development plans will increase clarity around their rights and obligations in the society and hence reducing community conflicts. In addition, marginalized groups will benefit from increased access to water at farm level. Namely, this will improve production systems and the availability of high quality produce in the foods system from which marginalized groups benefit as consumers. Productivity improvements and increases will can supply local value chains with marginalized groups benefiting indirectly from income generating activities being created along those value chains.

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Summary of key benefits of the proposed programme

Benefits	Project	Baseline
Economic benefits	<p>Two demo plots will showcase the potential of rainwater harvesting in two types of greenhouses: Single Span Greenhouses (SSG) and Arched Tunnel Greenhouses (ATG) tailored to pilot.</p> <p>The demos will simulate the different circumstances faced by farmers in the coastal areas and mid-altitude highlands.</p> <ul style="list-style-type: none"> - Reduced pumping and increasing the resilience of greenhouse product growers will avoid sea 	<ul style="list-style-type: none"> - Plant water demand will be increasing under future climate, along with the population demand while water quantity and quality are adversely affected. Excessive pumping into a lowered water table will increase the cost of production. Limited water resources will affect irrigated areas, and consequently production is decreased. - Farmers have already invested in drip irrigationsystems but have not

	<p>intrusion and water salinity in coastal areas and sustain greenhouse production.</p> <ul style="list-style-type: none"> - The new SSGs will enhance the crops' quality and productivity of greenhouses to become GAP certified. This will strengthen the exporting potential and thus enhance the economic situation in the target areas. While the promotion of the more affordable ATG will make the technology more accessible to more farmers during the economic crisis. - <u>Rain water harvested from the 12 hill lakes will reduce costs by approximately 38% and will ensure continuous supply of water which in turn will increase annual crop yields.</u> - Drip irrigation will reduce the cost of the production as labor for weed control and reduce water consumption. - The overall reduction of inputs (water, fertilizers, herbicides, pesticides) from the enhanced early warning system, integrated pest management, water management, and other risk-coping practices will reduce the cost of production by more than 30%. Cereal and legume growers, olive and fruit tree growers and vegetable growers in northern Bekaa, Akkar, Dannieh and southern Lebanon will benefit from outcome 2. Yields are preserved, and consequently income is increased. <p>The number of benefiting municipalities, shepherds and households is around 1000, over an area of 3000km². 300,000 heads producing more than 20,000 tons of milk will benefit from this output which will tend to optimize the production under climate future scenarios, increase its productivity and its added value</p>	<p>benefitted from the HASAD hill lakes. If water distribution networks are not installed farmers will be less resilient to climate variations, crops will face water increased stress and decreased yields.</p> <ul style="list-style-type: none"> - Investing without taking into consideration adaptation measures that are suggested will leave farmers into the vicious circle of poverty. More inputs are used (chemicals, seedlings, etc.) nevertheless if they are not fit to climate change, the cost of the production will be higher, and the yields lower, which will double affect the income of farmers (cost of production could increase more than 20%). - Without a national fodder resource assessment coupled with sustainable rangeland management, shepherds will remain under <i>status quo</i>, leaving them subject to climate impact on their milk and meat production, and increasing their dependency on imported fodder, which will directly affect their income. Continuous degradation of the exhausted rangeland will result into increasing losses in production and animal lives (more than 300,000 heads affected). - The absence of flood risk management in prone valleys will keep on affecting aquaculture exploitations in Assi River, and consequently affecting the livelihood of many families. - The state will keep allocating disaster relief budgets for floods and climate impacts with an increasing trend.
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	<p>through increasing dairy processing by 25%; Activities of outcome 3 will sustain the income of shepherds under climate uncertainty and reduce flood risk in 2 valleys (2,300ha) in a sustainable manner.</p> <ul style="list-style-type: none"> - The necessary labor for conducting watershed rehabilitation and protection from floods will be pooled from the region itself, which would also increase job opportunities and income for the population. The Government, through the Higher Relief Commission, pays around USD 2.5 Million as compensation for local communities resulting from every flood occurrence in the focus areas. The project activities to reduce the impact of floods will help reduce this cost and allow for directing this funding to support developmental projects. 	
Social benefits	<ul style="list-style-type: none"> - MOA and LARI staff will benefit from outcomes 2 and 3 to better understand agriculture crops and rangeland performance under future climate and familiarize them with risk coping agriculture practices and sustainable rangeland management as tools to cope with climate change. They will also be trained to identify, collect, propagate and disseminate fodder species. MOA and LARI will be empowered with the necessary infrastructure to achieve outcomes 2 and 3. - Better linkage and collaboration between the different <u>stakeholders (governmental, private sector and communities) involved in the Water User Associations and the implementation of the rangeland management plans allows for the building of social capital between the actors. In the long term, this will lead to a reduction of</u> 	<ul style="list-style-type: none"> - The increased demand on water and rangeland limited resources will culminate conflicts among different users within the agriculture sector, and with the different sectors. - Human settlements around flood prone areas will be affected, and population will tend to migrate to urban areas and abandon agriculture lands. - Social instability and insecurity will amplify in the poor suburbs which are not ready to absorb additional rural migrants. - Reduced agriculture (and range) production will <u>increased</u> the dependence on food imports, and amplify the debt of the country and threaten food security. <u>This is further aggravated due to the economic meltdown increasing imported food prices whilst decreasing currency to import food.</u> - <u>The economic meltdown will increase societal conflicts around common</u>

	<p><u>community conflicts.</u></p> <p>— <u>Rangeland management plans will decrease conflicts in relation to the use of common pastures and trespassing. Clarity on the roles and responsibilities of different actors will better protect the interest of shepherds. parties is always a gain.</u></p> <p>- Farmers are more aware of climate change and its impact on their resources, income and livelihood. Their resilience and readiness to climate uncertainty are increased.</p> <p>- <u>Increasing the voice of women by including them in small-scale organizations, economically empowering women by offering income generating activities (e.g. distribution of medicinal plants) and improving the access to water which increases access to which could support women with domestic chores.</u></p> <p>- <u>The knowledge base around adoptive measures (both through the early warning system as well as researched project) will be increased which in Lebanon. In the short term, this will improve beneficiaries capacity to respond to disasters or adapt to climate change. Improved knowledge base will improve the overall human development in the context.</u></p>	<p><u>resources such as pastures.</u></p>
Environmental benefits	<p>- Improved awareness about water harvesting on greenhouses and improved access to 479,800m³ sustainable water sources through <u>greenhouse pilots and the HASAD project</u> hill lakes will reduce pressure on underground water supplies <u>and build the adaptive capacity to climate-induced water scarcity. Installation of drip water irrigation systems for 698 farmers will improve</u></p>	<p>- Without the project, the limited water and range resources will directly affect the natural ecosystems. <u>Unsustainable extraction of groundwater due to increasing water scarcity will lead to exploiting non-renewable water resources. In addition, a lower water table with increase sea intrusion, will negatively impact water quality and thus increase soil</u></p>

	<p><u>the efficiency of water management and reduce will reduce sea intrusion and water salinity in coastal areas.</u></p> <ul style="list-style-type: none"> - Early warning system (EWS) <u>will increase the resilience of 60,000 farmers in the target areas to climate shocks and provide them with a form of digital extension that integrates climate smart agriculture principles. The EWS coupled with capacity building for 200 famers (30% women) and technical guidelines on IPM, and risk-coping agriculture practices will decrease chemical use, soil and water pollution, preserve soil fertility and conserve soil and water enhance natural resources management.</u> No-till practice will <u>also</u> reduce carbon emission from agriculture soils <u>as a mitigation co-benefit.</u> - Rangeland sustainable management will protect the vegetation from further degradation, as overgrazing is minimized. Consequently the soil is protected from erosion by the enhanced vegetation cover, and water infiltration is increased. Appropriate management of herds in pastures will protect the biodiversity of rangeland species as well. Land degradation, erosion and floods are reduced, namely in the valleys where watershed rehabilitation will be implemented (in the 2 watersheds covering 2,300 ha). - Rehabilitation of the vegetation cover through tree and shrub plantation <u>(at least 425,000 seedling/year from rehabilitating one nursery)</u> will enhance carbon sequestration as well <u>as a mitigation co-benefit.</u> - <u>An enhanced policymaking process on climate aspects through knowledge management and advocacy of the project's lessons learned. Ongoing</u> 	<p>pollution. Both rangeland and fresh water ecosystems will suffer from further loss in biodiversity. Land degradation due to overgrazing will accelerate erosion and desertification. Flood risk which is already present <u>and increasing with climate change</u> will be amplified as the vegetation cover is depleted, with more damages to natural ecosystems and rural livelihood.</p> <ul style="list-style-type: none"> - <u>Communities will have low adaptive capacity to climate change without an early warning system that can help them respond to climate shocks. No training or capacity building will lead to a continuation of farming practices that are not climate smart. This would lead to maladaptation.</u> - <u>Policymakers will not benefit from necessary knowledge that would be created on the basis of the project's lessons learned and so will lead to a weaker policymaking process for environment and climate domains.</u>
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	<p><u>processes including the development of the National Adaptation Plan (NAP) and the update of the Nationally Determined Contribution (NDC) will be influenced by the knowledge generated by the project.</u></p>	
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C. Describe or provide an analysis of the cost-effectiveness of the proposed project / programme.

Investments in an area/sector, which is significantly affected by land degradation and adverse climate change effects, through innovative techniques and well-targeted activities would lead to increased cost-effectiveness. Reduced cost in relation to community organization and engagement (due to the blended nature of the operation) will further reduce the share of “soft activities”, leading to stronger investment and higher return. Cost-effectiveness will be further analyzed during project inception and implementation when actual and updated cost figures will be collected.

The proposed adaptation techniques to be implemented by the project, namely: water harvesting and irrigation, rangeland management, flood risk reduction, and agricultural adaptation techniques are all proven to be effective in enhancing resilience to climate change and are included in the country's NDC, enhancing agricultural productivity, as well as enhancing the sustainable use of natural resources. Thus the investments have relatively secured results and the fund is not being used on testing technologies with unknown effectiveness.

The project is mainly investment-oriented with a view to maximize the impact in a cost-effective manner. Around 74 percent of the programme budget is allocated for the implementation of Outcomes 1 and 3 that are dedicated to field implementation of needed infrastructure, material, and services and will directly benefit the targeted farmers and local communities. Around 14 percent of the budget allocated for Outcomes 2 and 4 dedicated for enhancing the technical capacities and know how on adaptation, and providing soft infrastructure and tools to relevant national and local institutions to enable them to provide the needed services to farmers.

The proposed outcomes and outputs have been developed to address climate-related agricultural priorities that are not only the most urgent and most pressing, but which can also be addressed through a bottom-up approach that generates lessons and case studies which can be used to develop a more systemic and systematic approach for a coherent national response to issues on the climate change-agriculture-food security interface. This will be promoted through the knowledge management and policy feedback loop components of the programme.

Project implementation will heavily rely on existing Government structures. This approach is believed to be particularly cost-effective, as it reduces the need for higher costs that would need to be spent on consultant-driven implementation, and it builds the capacity of the government system for ongoing and more widespread implementation of similar climate-sensitive development. The size of the project management unit (PMU) has been carefully considered, in order to keep costs down - at around 9.5% of the project budget - while still ensuring effective management of the project. The PMU staff will be selected from national experts and existing government staff. Alternative implementation arrangements were considered, including a higher number of programme staff and national and international consultants in the design, but this implementation option was not further elaborated as it carries higher short-term costs and will generate less long-term sustainability.

The cost effectiveness of the project components is further elaborated in the table below.

OUTCOME 1	Cost (\$)	Number of beneficiaries	Losses averted/Benefits generated	Alternatives to Project
Output 1.1: Rainwater harvested from greenhouse roof tops	106,000	2 poor farmer families for the pilots based on a total area of 0.5ha greenhouse cover. These exploitations can upgrade their storage capacity to cover more area, and the technology will be expanded by the Ministry of Environment and the Green Plan once the technology is spread amongst farmers.	The pilot systems will ensure 800m ³ . The stored water will be used in late summer / autumn, in period where the water table is low and exposed to salinity. Soil and groundwater salinity are minimized and agriculture is sustained. Crop resilience to climate change is enhanced.	<ul style="list-style-type: none"> -The recharge of the aquifers is unreasonable and requires more fresh water amounts that cannot be easily supplied in the dry season. - Desalinization of sea water is not a familiar technology for Lebanon and requires an energy source and a water distribution system which require higher investments and increases the cost of production. - Reuse of treated wastewater is feasible, however no stations are functional in the region, and the water distribution system is lacking. - Most farmers still use arched greenhouses with limited access to SSG.
Output 1.2: Improved access to climate-resilient water & Water efficient irrigation systems deployed	1,814,000	More than 689 farmers benefit to deploy efficient irrigation systems to benefit from 12 hill lakes with primary irrigation networks constructed by the project	Access to 479,000m ³ of harvested rain water. The harvested water will enable the irrigation of 262ha. Efficient irrigation will increase the irrigated surface, reduce water losses, and reduce chemical uses (herbicides, fertilizers) and labor. Yields are homogeneous and expected to increase by 15% when compared to surface irrigation. The cost of production will be decreased by 20% at least. Adapting irrigation schedule to climate and plant demand will increase the resilience to climate change. Networks for 2 hill lakes out of the 12 were fully implemented by WFP	<ul style="list-style-type: none"> - Farmers can still rely on surface irrigation; this will increase water and nutrient losses, weeds infestation, labor for land preparation, weed control and for irrigation. The cost of production is higher. The use of chemicals and machinery for plowing will increase GHG emissions.

			who also paid for their costs after a successful cooperation with AgriCAL.	
OUTCOME 2	Cost (\$)	Number of beneficiaries	Losses averted/Benefits generated	Alternatives to Project
Output 2.1: Enhanced early warning system to farmers through improved existing system	375,000	All farmers of Lebanon can benefit from the system, at different levels according to the provided service (water management, IPM, etc.). The research community, decision makers, technicians and insurance companies are also benefiting from the system.	The losses averted are those related to the impact of adverse climate effects on crops (i.e. frost, drought, etc.) that can be avoided through early warning. Moreover, the system enabling the prediction of pest and disease infestation as well as water demand, will minimize the damages on crops, and increase the resilience of farmers to climate change.	Farmers producing under uncertainty will be under continuous climatic pressure and pest outbreaks, with an increasing trend with future climate scenarios. Losses will be amplified; systematic spraying of chemicals will increase the cost of production and pollution. Budget allocated for relief will be amplifying the burden of debt of the state.
Output 2.2: Expanded farmer outreach and ensured financial and management sustainability of the warning system	25,000	All farmers in the project focus areas, LARI, Research Institutes, NGOs and Insurance companies	The efficiency of the system depends on the successful outreach to farmers. The activities under this outcome will ensure the maintenance and proper management of the early warning system. These activities will ensure the budget return and financial sustainability.	The past and future investments in weather stations will not prove useful to farmer, LARI, and MOA. The farmers will be re-exposed to climate adverse and their resilience will be weakened.
Output 2.3: Capacity building on adaptation techniques for vulnerable field crops enhanced	180,000	Cereals and legume growers in the two focus areas. LARI staff, MOA and MOE Technicians.	Farmers will be able to increase their yields under current and future climate (up to 15% increase), rationalize their inputs (water, fertilizers), save scarce water resources, minimize energy and labor for land preparation (reduction of cost of production by 624\$/ha). IPM practices will reduce spraying, pollution hazards, and the cost of production as well. All these measures will increase the adaptation capacity. Farmers' income will be preserved if not	- Farmers will continue growing the same way, thus facing more climate negative impact on yields and product quality. The cost of production will increase due to improper agriculture practices. Farmers' income will be reduced. - Farmers will shift to other crops that require more investments, and rely more on inputs and natural resources exploitation, leading to unsustainable agriculture cropping pattern.

			increased.	
Output 2.4: Guidelines and recommendations on agricultural adaptation techniques for vulnerable areas developed	67,000	Vegetable, olive, and fruit growers of the two focus areas. LARI staff, MOA and NGOs technicians will take advantage to increase their knowledge on the impact of climate change and adaptation tools for the agriculture sector. This will increase the readiness to climate change.	Farmers will be acquainted to new technologies enabling them to cope with climate change, and preserve their production. These technologies are also tools to minimize inputs (water, fertilizers, herbicides and pesticides) and thus reduce the cost of production up to 30%. Products will be less subject to climate impacts, and to pesticide residues, which increases their competitiveness on both local and international market.	<ul style="list-style-type: none"> - Farmers may adopt organic farming. However, this might result in technical problems related to yield reduction, insect or disease outbreaks, and higher cost of production, especially with the cost required for certification. - Farmers will rely on intensive agriculture, which requires more inputs, more investments and result in a higher cost of production. The yield will not necessarily increase under future climate scenarios, if proper practices and adaptation measures are not deployed.
Output 2.5: National fodder resource assessment prepared	365,800	All shepherds of Lebanon, municipalities or communities owning rangeland, the DRDNR and LARI staff	Rangeland covers more than 50% of the country. A first assessment will enable the deployment of management plans. Around 1,000,000 heads of goat and sheep depend on rangeland and the livelihood of the shepherds is related to the grazing service provided by these natural ecosystems that are vulnerable to climate change.	Without assessing the fodder, and consequently the carrying capacity of rangeland, overgrazing will result in rangeland degradation. The climate trend will accelerate the depletion of these resources, loss of biodiversity, erosion and desertification.
OUTCOME 3.	Cost (\$)	Number of beneficiaries	Losses averted/Benefits generated	Alternatives to Project
Output 3.1: Community-based sustainable rangeland management plan prepared	776,000	500 households will benefit from this output, the municipalities managing communal rangelands, DRDNR.	More than 375,000 heads of goat and sheep are likely to be found in the pilot area which is situated within the most vulnerable area to climate change and desertification. Shepherds in this area along with land owners will be able to implement under the assistance of DRNR	Farmers will either reduce the number of herds, or increase their dependency on imported forage by at least 30% under future scenarios, with increasing fodder prices. The imported fodder annually will not be cost-effective, as the rangeland will continue to degrade and dairy products

			<p>sustainable management practices which would sustain both natural resources and livelihood of the households. The processing, storing and marketing of dairy products will increase the income of households, empower women. The equilibrium between fodder from natural resources and imported forage will be optimal. The natural ecosystem is capable to cope with climate rangelands are less subject to overgrazing, vegetation cover is able to sustain and protect the soil from erosion. The DRNR laws are reviewed and ensure a proper enabling environment for exploiting rangeland under a win-win situation for shepherds and land owners. Revenues generated for both parties are preserved.</p>	<p>increasing prices will not cover the losses in profits.</p> <ul style="list-style-type: none"> - The payment of compensations and subsidies for affected households or for shepherds to withdraw from a rangeland for protection is not a sustainable alternative. - The change in land use of rangeland into forests, quarries or agriculture land will result in a heavier environmental impact, leading to increasing pressure on the remaining pastures.
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Output 3.2: Restored degraded rangeland areas and reduced flood risks	2,691,000	Communities of AL Qaa watershed and the surrounding area in Baalbak caza and Wadi AL Kareem, Dabour and the surrounding areas in Hermel (i.e.Faara), shepherds, aquaculture exploitations along Assi River and farmers affected by floods. 300ha of degraded land restored through plantation of shrubs and tree seedlings and enrichment with fodder species.	The infrastructure cost will enable reduce flash flood damages . The damage to the agriculture areas and to the aquaculture exploitations caused by flash floods will be minimized. Farmers' resilience an livelihood will be preserved, and the disaster relief compensations saved. The rehabilitation of the watershed will increase the cost- effectiveness and efficiency of the deployed infrastructure. Moreover, the ecosystem will be restored, and will provide more services for the communities.	<ul style="list-style-type: none"> - The construction of bigger dams requires more investment. - The payment of compensations for affected communities will not resolve the problem on the long run. With future climate, floods are expected to be more frequent and more damaging as the volume of the carried debris and erosion will be amplified. The life of the infrastructure will be reduced.
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Quantitative Cost Effectiveness Analysis of Proposed Changes

This section describes in detail the cost effectiveness of the changes proposed under each output, where appropriate. The only two outputs not demonstrated here are outputs 1.1 and 4.1 because a cost effectiveness analysis is not appropriate and will not yield logical results since their main objectives were fundamentally changed due to the reasons explained in Section A.

Output 1.2: Looking at the proposed changes under this output from a cost effectiveness perspective, it becomes very clear that these changes were necessary and considerably more cost effective. The objectives of this output in the original design was to increase farmers efficiency in utilizing rain harvested water from the 12 hill lakes, **assuming access to the 12 hill lakes**, by providing 400 farmers with efficient irrigation systems that would cover 150ha. First and foremost, in regards to the main irrigation networks of the 12 hill lakes, if this change is not made there will be no efficient use of rain water harvesting because the rain water wouldn't reach the farmers to begin with, thus rendering the cost effectiveness of the original design of this output ZERO, especially from a climate adaptation perspective. Also, the proposed change increases the number of beneficiaries from 400 to 698 and the number of hectares brought under efficient irrigation practices from 150ha to 174.5ha. With this in mind, the cost effectiveness of the proposed change can be quantified as a follows:

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Objectives	Scenario 1: Maintaining the original design of output	Scenario 2: Adopting the proposed changes
Access to harvested rain water to enhance adaptation to climate change	$\frac{\$0 \text{ cost}}{479,000 \text{ m}^3 \text{ increased access to harvested rain water}} = 0 \text{ m}^3 \text{ increased access to harvested rain water}$	$\frac{\$1,233,000 \text{ cost}}{479,000 \text{ m}^3 \text{ increased access to harvested rain water}} = \$2.57 \text{ per extra m}^3$
Land brought under efficient water practice	$\frac{\$420,000 \text{ cost}}{150 \text{ ha}} = \$2,800 \text{ per extra hectare}$ Increase in land under efficient irrigation	$\frac{\$581,000 \text{ cost}}{174.5 \text{ ha}} = \$3,330 \text{ per extra hectare}$ Increase in land under efficient irrigation
Number of beneficiaries supported with efficient irrigation systems	$\frac{\$420,000 \text{ cost}}{400 \text{ beneficiaries}} = \$1,050 \text{ per extra beneficiary}$	$\frac{\$581,000 \text{ cost}}{698 \text{ beneficiaries}} = \$832 \text{ per extra beneficiary}$

The above cost effectiveness analysis clearly demonstrates that the proposed changes are more cost effective in achieving the output's overall objective. Although there is a slight increase of 20% in the cost per hectare of efficient irrigation; however, this increase is clearly offset by the increase in number of beneficiaries and, more importantly, by giving beneficiaries access to rain harvested water to achieve the climate adaptation benefits envisaged in the original design. This is without even considering the hyperinflation that the country faced from the time of the original design until now which will most definitely justify the 20% increase in cost per hectare¹⁹.

Output 2.1: The cost effectiveness of the proposed changes to this output is apparent in the number of additional stations when compared to the original design. Considering that many of LARI's stations are either not functioning or do not exist in the targeted area, the estimated 49,000 subscribers to LARI's website are not getting accurate early warnings for their respective geographic location. Therefore replacing or putting new stations in place will add significant value to these beneficiaries. Furthermore, as it stands today, LARI's website doesn't fully qualify as an EWS in today's standards because users must constantly keep checking the website. On the other hand, the fact that the proposed changes include a smartphone application that will alert beneficiaries automatically enhances the overall effectiveness of the EWS significantly. The cost per beneficiary is more effective since the number of beneficiaries is also significantly higher considering that the proposed changes increases the beneficiary target from 20,000 to 60,000.

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Objectives	Scenario 1: Maintaining the original design of output	Scenario 2: Adopting the proposed changes
Additional Weather Stations	$\frac{\$190,000 \text{ cost}}{2 \text{ weather stations}} = \$80,000 \text{ per extra weather station}$	$\frac{\$356,000 \text{ cost}}{13 \text{ weather stations}} = \$27,385 \text{ per extra weather station}$
Smartphone Application	$\frac{0 \text{ cost}}{0 \text{ Smartphone Application}} = 0 \text{ Smartphone Application}$	$\frac{\$19,000 \text{ cost}}{1 \text{ Smartphone Application}} = \$19,000 \text{ per extra Smartphone Application}$
Number of additional beneficiaries	$\frac{\$190,000 \text{ cost}}{20,000 \text{ additional beneficiaries}} = \$9.5 \text{ per extra beneficiary}$	$\frac{\$375,000 \text{ cost}}{60,000 \text{ additional beneficiaries}} = \$6.25 \text{ per extra beneficiary}$

Output 2.2: For this output the cost effectiveness of the proposed change is very straightforward since a higher overall result will be achieved at a much lower cost.

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¹⁹ According to World Bank inflation in Lebanon is estimated at approximately 78% from 2012 to 2020. Link: <https://data.worldbank.org/indicator/FP.CPI.TOTL.ZG?locations=LB>

Objectives	Scenario 1: Maintaining the original design of output	Scenario 2: Adopting the proposed changes
Private sector strategy to achieve financial sustainability of EWS	$\frac{\$100,000 \text{ cost}}{\text{Financial sustainability strategy}} = \$100,000 \text{ per financial sustainability strategy}$	$\frac{\$25,000 \text{ cost}}{\text{Financial sustainability strategy}} = \$25,000 \text{ per financial sustainability strategy}$
Number of beneficiaries of EWS	$\frac{\$100,000 \text{ cost}}{20,000 \text{ beneficiaries}} = \$5 \text{ per extra beneficiary}$	$\frac{\$25,000 \text{ cost}}{60,000 \text{ beneficiaries}} = \$0.42 \text{ per extra beneficiary}$

Output 2.3: The cost effectiveness of this proposed change might seems slightly negative as a result of excluding Marjayoun. However the fact that it is not feasible to implement this output in Marjayoun, as explained in Section A, clearly justifies this slight deviation in the output's cost effectiveness. Moreover, taking into consideration that the deviation is only 8%, this can be logically attributed to inflation since the project original cost estimations²⁰.

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Objectives	Scenario 1: Maintaining the original design of output	Scenario 2: Adopting the proposed changes
Geographic areas with demonstration plots	$\frac{\$250,000 \text{ cost}}{3 \text{ areas with demo plots}} = \$83,333 \text{ per extra area}$	$\frac{\$180,000 \text{ cost}}{2 \text{ areas with demo plots}} = \$90,000 \text{ per extra area}$
Number of beneficiaries trained through demo plots	$\frac{\$250,000 \text{ cost}}{300 \text{ beneficiaries}} = \$833 \text{ per extra beneficiary}$	$\frac{\$180,000 \text{ cost}}{200 \text{ beneficiaries}} = \$900 \text{ per extra beneficiary}$

Output 2.4: The cost effectiveness of the proposed change is very evident taking into consideration that the same objective will be achieved at a significantly lower cost as illustrated below.

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Objectives	Scenario 1: Maintaining the original design of output	Scenario 2: Adopting the proposed changes
Guidelines produced and disseminated	$\frac{\$400,000 \text{ cost}}{5,000 \text{ copies}} = \$80 \text{ per extra copy/guideline}$	$\frac{\$67,000 \text{ cost}}{5,000 \text{ copies}} = \$13.4 \text{ per extra copy/guideline}$

Output 2.5: Since the difference between the two scenarios is very clear in this case, no further explanation is required to illustrate that the proposed change is considerably more cost effective.

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Objectives	Scenario 1: Maintaining the original design of output	Scenario 2: Adopting the proposed changes
National Fodder Assessment	$\frac{\$860,000 \text{ cost}}{1 \text{ National Fodder Assessment}} = \$860,000 \text{ per Assessment}$	$\frac{\$365,800 \text{ cost}}{1 \text{ National Fodder Assessment}} = \$365,000 \text{ per Assessment}$

Output 3.1: The proposed changes under this output are more cost effective and also necessary. This is due to the fact that the original design did not take into consideration the needed support to beneficiaries in order to incentivize them to stop grazing to allow rangeland recovery. Without this support to beneficiaries the management plan will be utterly useless and its outcomes will not be implemented. Accordingly the proposed changes will ensure the implementation of the management

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²⁰ According to World Bank inflation in Lebanon is estimated at approximately 78% from 2012 to 2020. Link: <https://data.worldbank.org/indicator/FP.CPI.TOTL.ZG?locations=LB>

plan and at the same time reach more beneficiaries since two management plans will produced instead of one. The beneficiaries of the Balabak management plan are considered to be indirect beneficiaries since the project will only produce the management, but will not implement it.

Objectives	Scenario 1: Maintaining the original design of output	Scenario 2: Adopting the proposed changes
Management Plan	$\frac{\$580,000 \text{ cost}}{1 \text{ management plan}} = \$580,000 \text{ per extra management plan}$	$\frac{\$776,000 \text{ cost}}{2 \text{ management plan}} = \$388,000 \text{ per extra management plan}$
Number of beneficiaries (Direct & Indirect)	$\frac{\$580,000 \text{ cost}}{200 \text{ direct beneficiaries}} = \$2,900 \text{ per extra beneficiary}$	$\frac{\$776,000 \text{ cost}}{670 (200 \text{ direct} + 450 \text{ indirect})} = \$1,160 \text{ per extra beneficiary}$

Output 3.2: For output 3.2 the proposed changes will enhance the cost effectiveness significantly. Although one instead of two nurseries will be rehabilitated, the production capacity of the Abdeh nursery is four times more when compared to the original design. Nonetheless it is a bit difficult to compare both scenarios since the original design only had a total cost for both the nursery and the flood reduction infrastructure. To overcome this difficulty an assumption will be made that the original design had the same percentage as the proposed change of output total funds allocated to the nursery (approximately 5%). In regards to the flood control infrastructure, the improved cost effectiveness under the proposed changes is clearly evident since the area protected will increase by more than double. Furthermore, the number of beneficiaries from the flood control infrastructure was also not mentioned in the original design, but at this stage an estimation can be made for the two targeted areas in which 12,200 households are expected to directly benefit from this infrastructure.

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Objectives	Scenario 1: Maintaining the original design of output	Scenario 2: Adopting the proposed changes
Seedlings produced by rehabilitated nurseries	$\frac{\$101,600 \text{ cost}}{125,000 \text{ seedlings per year}} = \$0.81 \text{ per extra seedling per year}$	$\frac{\$198,800 \text{ cost}}{500,000 \text{ seedlings per year}} = \$0.40 \text{ per extra seedling per year}$
Area brought under flood risk protection	$\frac{\$1,868,400 \text{ cost}}{166 \text{ km}} = \$11,255 \text{ per extra km}$	$\frac{\$2,492,210 \text{ cost}}{366 \text{ km}} = \$6,810 \text{ per extra km}$
Number of additional beneficiaries	$\frac{\$1,970,000 \text{ cost}}{\text{n.a.}} = \text{n.a.}$	$\frac{\$2,691,000 \text{ cost}}{12,200 \text{ beneficiaries}} = \$221 \text{ per extra beneficiary}$

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Preliminary analysis of the cost-effectiveness of main project activities

The data is extracted from the Technology Needs Assessment; Barrier Analysis Report prepared by the Ministry of Environment and UNDP.

1. Rainwater harvesting from greenhouse roof tops (RWHG)

Design Parameters and benefits of RWHG

- An annual average rainfall of 600mm are necessary to cover from RWHG, water demand for the crops inside a greenhouse.

- A storage unit can be used for irrigation before being totally filled, assuming that a storage unit could be filled twice a year.
- The annual demand of a standard greenhouse of 400m² is between 360 and 550m³ depending on the crop type and microclimatic conditions.
- The collected water from a standard greenhouse is 240m³ for an area with average precipitations of 600mm/year, up to 400m³ in areas having 1000mm/year of rainfall.
- The storage unit of a greenhouse should have a minimal capacity of 125m³ (half of the annual water demand) in exploitations with limited land available.
- Cost of storage unit is 8\$/m³ in earth reservoirs. The economy of scale is not accounted.
- Cost of drainage system (30\$/m) or 1200\$/greenhouse. This can be reduced by half in "Chappelle" system.
- Current maximal cost of land rental (value of area dedicated for earth reservoir): 1\$/m²/year. The economy of scale is not accounted.
- Pumping cost is USD1.833m³ at 500m a.s.l, on a deep water table.
- In this exercise we consider that the price is the same even next to sea level where water table is shallow, in order to value the poor quality of water (salinity).
- Surface water annual fees in a common irrigation scheme is 100\$/year. We assume that this water is rarely available all year round due to several reasons (water shortage, leakage problems, water pollution, etc.).
- A greenhouse produces 4t of crops, sold at 800\$/t, generating a revenue of 3200\$/ha/year.

The deducted benefits are calculated by deducing only the cost of water from the revenue (3200\$/year/greenhouse). Under all scenarios, RWHG is the most beneficial to farmers, except if the farmer has a sustainable surface water of a standard quality all year round. Even if RWHG does not cover all the water demand, 43% of the water demand will keep the system cost-effective

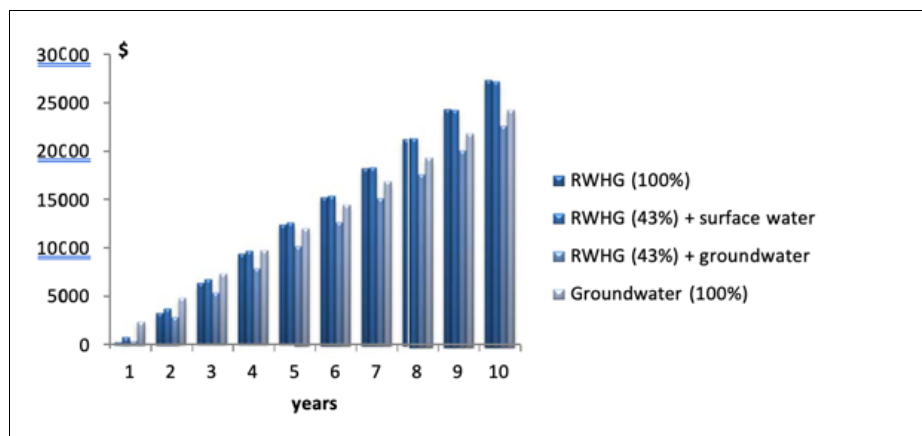
In addition, farmers will be more autonomous in terms of water availability and rely less on other fluctuating resources, which would increase their resilience and reduces conflict risks among water users. Accordingly, farmers will put more efforts in preserving water resources that will enable them to keep producing, and consequently sustain their revenue and food security.

Discounted benefits of RWHG over a period of 10 years for different water source scenarios:



.....

Cumulative discounted benefits of RWHG over a period of 10 years from different water source scenarios:



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.

Lebanon has signed the United Nations Framework Convention on Climate Change (UNFCCC) in June 1992 and has ratified the convention on August 11th 1994 by virtue of Law 359, and acceded to the Kyoto Protocol on November 13th 2006 by virtue of Law 738.

Lebanon has ratified the UNCBD in 1993, and the UNCCD three years later, in 1996. While ratification demonstrates a commitment to international legislation, the Government of Lebanon is striving to apply real measures for fulfilling the goals set in the Conventions. In spite of that, Lebanon still needs additional financial, technical and human means to implement all three

Conventions.

Lebanon is eligible to receive funding from the Adaptation Fund as a developing country party to the Kyoto Protocol and is vulnerable to the adverse effects of climate change, due to its arid and semi-arid environment, relatively small geographic area, propensity to desertification, its low-lying coastal area and fragile mountain ecosystem, and its existing high levels of vulnerability to climate variability.

The Government is contributing to Climate Change negotiations at the international level and is promoting adaptation and mitigation measures at the national level to the best extent possible. The Ministry of Environment has prepared the Second National Communication under UNFCCC that identified the agriculture sector as heavily affected by the predicted impacts of climate change. In addition, a large proportion of the rural population, particularly the poor, depend on agriculture and livestock for their livelihood.

Accordingly, the Government is committed to promote and implement all measures that would increase the resilience of agriculture to climate change, focusing on water as a key natural resource for agricultural productivity and development in the country.

In addition to its direct contribution directly to the fulfillment of the priorities and recommendations set out in Lebanon's SNC and TNC to UNFCCC, the project is fully aligned with the Government of Lebanon objectives of rural poverty alleviation; and its priorities for water resources development and management, introduction of sustainable agricultural support services and infrastructure, and preserving natural resources, as expressed on the Ministerial Statement of the current government. Alignment of the project activities with the 2020 updated NDC has been mapped in Part I.

Agriculture Strategy. In 2004, the MOA prepared an Agriculture Strategy with the assistance of the "Support to Agricultural Census Project" implemented by FAO and financed by the World Bank. The Agriculture Strategy document identifies the following three main constraints to the development of agriculture in Lebanon in accordance with its potential: lack of sufficient mobilization of water, lack of appropriate agricultural extension and rural advisory services, and deficiencies in the prevailing marketing systems. The Agriculture Strategy defines accordingly seven main strategic directions : (i) increasing the mobilization of water resources and improving water efficiency; (ii) improving land use and management, and soil conservation; (iii) disseminating improved farm technology (varieties, cultivation practices, disease control); (iv) improving the efficiency of commodity chains; (v) taking into account the spatial dimension of agriculture and rural development, with support to local development initiatives; (vi) renovating the public and private institutional setup; and (vii) promoting stakeholder participation and diversification of rural activities.

The MOA is currently reviewing its strategy and plans to address the various constraints facing the agriculture sector, not only from an economic perspective but also from the perspective of bringing about social balance and poverty reduction. The EU and the FAO/Italian Cooperation are supporting this effort. IFAD is contributing to the capacity building of the MOA for pro-poor and gender-focused update of the Lebanese agricultural development strategy through a small grant.

The project also supports the implementation of the United Nations Development Assistance Framework 2010-2014 (UNDAF) by complementing planned programmes under rural development, environment and agriculture pillars.

IFAD Country Strategy and Opportunities Paper (COSOP) for Lebanon (2000) has identified five main strategic thrusts for the country programme: (i) promotion of on-farm and off-farm enterprise development; (ii) reduction of production costs through investments in new technology, use of high yielding varieties and improved water use efficiency; (iii) increase in the value added of agricultural products; (iv) promotion of local associations and grassroots

organizations, mainly credit cooperatives; and(v) empowerment of the rural women. The objectives of the COSOP(2000) remain valid today although higher priority is now placed on improved water resources management and access to capital, by the government and the farmers, respectively.

E. Describe how the project / programme meets relevant national technical standards, where applicable.

Relevant national technical standards required by the Government of Lebanon, including environmental impact assessments, regulations that guide construction and infrastructure development, water related regulations, land management and land use regulations, and agricultural codes and guidelines will be taken into account. In addition, the standard quality guidelines of MOA, GP and LARI will be applied.

Moreover, all IFAD supported projects are appraised before approval. During appraisal, appropriate experts and stakeholders ensure that the project has been designed with a clear focus on agreed results. The appraisal is conducted through the formal meeting of the Quality Evaluation Committee established by IFAD. The committee members are independent in that they should not have participated in the formulation of the project and should have no vested interest in the approval of the project. Appraisal is based on a detailed quality programming checklist which ensures, amongst other issues, that necessary safeguards have been addressed and incorporated into the project design.

The below two figures show the responsibilities in Lebanon when it comes to water and land aspects

Function	MOEW	RWEs	LRA	CDR	MOE	MOPH	Other
Planning	X	X		X			
Licensing and permitting (inc. EIAs)	X				X		X
Capital Investment	X	X		X			X
Infrastructure construction	X	X		X			X
Operation & maintenance	X	X					
Financing (national)	X	X		X			
Financing (external funding)	X			X			
Regulations and guidelines	X				X	X	
Water quality / quantity monitoring	X		X		X		
Hydro-power plants	X		X				

Notes: "Other" includes Council for the South, Municipalities, other ministries and agencies

Responsibility \ Party	MOPWT (DGUP)	MOE	MOA	MOC (DGA)	MOEW	MOIM	CDR	Religious Orders
National land use master planning	X						X	
Protected areas management		X	X					
Forest Management		X	X					
Urban planning regulations	X							
Public maritime domain (coastal zone)	X							
Protection of cultural heritage				X				X
Protection of rivers and waterways	X	X			X			
Management of religious estates								X
Quarry sector		X			X	X		

Note: The above delineation of responsibilities is not exhaustive and subject to change.

The project will specifically comply with the following laws:

Output	Law/Technical Standard	Compliance Mechanism
<u>Output 1.1: Rainwater harvested from greenhouse roof tops</u>	<ul style="list-style-type: none"> Water Law No.77 of 2018²¹ National Guideline for Rainwater Harvesting Systems Environmental Impact Assessment Decree No. 8633 of 2012²² Environmental Protection Law No.444 of 2002 	<p>The Ministry of Environment (MoE) is overseeing this activity and will sign the MoU with the two farmers whose land host the two pilots for rainwater harvesting from greenhouse roof top to ensure operation and maintenance arrangements are in place. MoE ensures compliance to environmental impact assessment process and the related laws. The type and/or scale of most activities of the project do not require detailed EIA.</p> <p>In addition, the ongoing coordination with the Ministry of Energy and Water (MoEW) ensures compliance to the water law and the National Guideline for Rainwater Harvesting Systems.</p>
<u>Output 1.2: Water efficient irrigation systems deployed</u>	<ul style="list-style-type: none"> Water Law No.77 of 2018²³ Municipal Law decree 118/77 Environmental Impact Assessment Decree No. 8633 of 2012²⁴ Environmental Protection Law No.444 of 2002 	<p>The ongoing coordination between Green Plan and the MoEW ensures compliance to the Water Law. All the necessary permits are issued by the contractors according to the Municipal Law as stipulated in the contracts for water networks. The ongoing coordination with municipalities and WUAs will ensure that the operation and</p>

²¹ Issued after AgriCAL's approval.

²² Issued during AgriCAL's approval process.

²³ Issued after AgriCAL's approval.

²⁴ Issued during AgriCAL's approval process.

		<p><u>maintenance arrangement are well in place after the project completes.</u></p> <p><u>Also the presence of the MoE as an Executing Entity in the project ensures following the environmental protection law. Finally, the type and/or scale of most activities of the project do not require detailed EIA.</u></p>
<p><u>Output 3.1: Community-based sustainable rangeland management plans prepared</u></p>	<ul style="list-style-type: none"> • <u>Forest Code of 1949</u> • <u>Law 85 for the protection of forests was promulgated in 1991 and amended by law 558 in 1996.</u> • <u>Land Resources: Decree 2366/2009</u> 	<p><u>The rangeland management plans are being executed by the Directorate of Rural Development and Natural Resources (DRDNR) under the Ministry of Agriculture (MoA) who will follow the forest and land laws during the formulation process and supervise the implementation of the plans. The rangeland management plans will detail all the aspects of operation and maintenance based on the participatory approach outcomes.</u></p>
<p><u>Output 3.2: Restored degraded rangeland areas</u></p>	<ul style="list-style-type: none"> • <u>Water Law No.77 of 2018²⁵</u> • <u>Municipal Law decree 118/77</u> • <u>Land Resources: Decree 2366/2009</u> • <u>Environmental Impact Assessment Decree No. 8633 of 2012²⁶</u> • <u>Environmental Protection Law No.444 of 2002</u> • <u>Resolution No. 471/1 of 2006 abrogating Resolution No. 52/1 of 2000 regulating the establishment, production and control of private nurseries in Lebanon.</u> 	<p><u>The ongoing coordination between MoA and MoEW ensures compliance to the Water Law. All the necessary permits are issued by the contractors according to the Municipal Law as will be stipulated in the contracts. The MoA the will ensuring following the land law in all the output's interventions as well as the resolution on establishing nurseries where relevant. The MoA will ensure maintenance of the infrastructure and ensure rangeland restoration is monitored.</u></p> <p><u>Also the presence of the MoE as an Executing Entity in the project ensures following the environmental protection law. The MoE will ensure that the construction works are screened as part of the Environmental Impact Assessment process and then advise on the necessary studies and documents accordingly.</u></p> <p><u>See the figure below on the EIA process.</u></p>

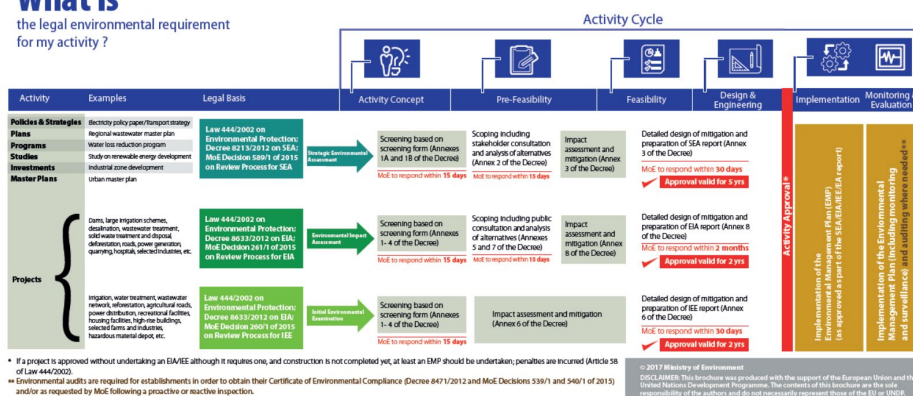
The figure below describes the EIA process managed by the Ministry of Environment which the project is already following during implementation.

²⁵ Issued after AgriCAL's approval.

²⁶ Issued during AgriCAL's approval process.

What is

the legal environmental requirement
for my activity?



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

IFAD has designed and co-financed, along with OFID and the Government of Lebanon, the "Hilly Areas Sustainable Agricultural Development" (HASAD) Project that is currently under implementation with the Ministry of Agriculture. The project targets priority arid and semi-arid areas with high poverty levels where local communities depend primarily on agriculture for their livelihoods. HASAD aims at achieving a sustainable increase in agriculture productivity and incomes by:

- Improving water and soil management in rain-fed areas through participatory development of small and medium-scale water harvesting infrastructure, together with soil conservation works.
- Improving agricultural production and market linkages for small farmers through the provision of technical support services.
- Strengthening the capacities of the implementing agencies and partners.

In spite of the large scope of work of HASAD project, additional technical and financial resources are needed to complement the project activities by adding more emphasis on adaptation measures needed in the target areas and at the national level. The proposed AgriCal project will complement HASAD activities as follows:

- With regards to water harvesting, HASAD project will only use hilly lakes for water harvesting and provide the main irrigation canal in some areas to link the lakes to the farms at the farm gate level. AgriCal project will complement this component of HASAD by providing on-farm water efficient irrigation systems and training on their installation and use. Previous experiences with hilly lakes in Lebanon showed that farmers are not using efficiently the existing lakes as they were not provided with the appropriate on-farm irrigation systems. Accordingly, AgriCal will ensure that the hilly lakes built by HASAD will be used by the targeted farmers. In addition, AgriCal will introduce other means for water harvesting including greenhouses and roads.
- With regards to the provision of technical support services, HASAD will establish Farmer Service Centers that will provide specialized services to farmers by enhancing the traditional

extension services of MOA and emphasizing on marketing issues. AgriCal will complement this component by adding the Climate Change dimension to these services through the provision of technical support and demonstration of the identified climate change adaptation techniques. In addition, HASAD does not cover rangeland management and early warning systems.

- At the policy level, AgriCal will also support the efforts of the Ministry of Agriculture, the Ministry of Environment and other national stakeholders in advancing climate change adaptation priorities in the agriculture sector whereas HASAD policy work does not cover this aspect. AgriCal's work on policy and knowledge management will add the climate change dimension and provide additional means to implement HASAD's policy recommendations and lessons learnt.

Links with Complementary Projects

In addition to IFAD HASAD project, this proposed project will complement with other projects, namely:

- A FAO supported project (TCP/LEB/3002) assisting MOA to strengthen and build the capacity of its extension services and to introduce an extension strategy based on Private-Public-Partnership (PPP);

AgriCal will complement this project by introducing the climate change adaptation techniques, experiences, and knowledge to the extension strategy.

- The Improved Production and Marketing Capacities of the Lebanese Agricultural Products (PMCLAP) Project with funding from the Italian Cooperation Office (ICO) to increase the quantity of exportable fresh agricultural produce through training within the whole value chain including farmers, traders and exporters with emphasis on the role of MOA in the process;

AgriCal will complement this project by enhancing the potential of the export of some crops by enhancing the production in greenhouses, IPP practices, and providing early warning advice to farmers so that they do not lose their crops planned for export.

- The UNDP project on Flood Risks Management and Water Harvesting for Livelihood Recovery in Baalback-Hermel (Phase I & II) funded by the Lebanon Recovery Fund. The project aims at assisting the Government of Lebanon in its recovery efforts in the conflict-affected and desertification-prone region of Baalback – El Hermel through better land management practices, namely: flood risk reduction, restoration of vegetation cover and improved availability of irrigation water needed to increase crop productivity and improve standards of living;

The experiences gained from the above-mentioned project will be taken into account while designing the relevant activities of AgriCal. AgriCal will cover two additional watershed that not covered by this or any other planned project. will complement this project by

- The FAO Recovery and Rehabilitation of the Dairy Sector in Bekaa Valley and Hermel-Akkar Uplands project funded by the Lebanon Recovery Fund. The project is aiming to bring urgent assistance to dairy sub-sector with emphasis on strengthening the capacity of milk production of poor dairy smallholders, where their dairying is threatened by low price for milk marketing and soaring feed prices with increasing cost of milk production;

The FAO project targets dairy sector farmers that raise livestock in their farms. AgriCal project will target shepherds depending on rangelands to raise their livestock. Synergies will be built between the two projects in relation to enhancing the quality and market of milk and dairy products.

- EU programme for Support of Local Development in North Lebanon with two strategic objectives: improvement of competitiveness of agricultural sector and conservation and valorization of environmental assets of the region.

AgriCal will complement this project by working on geographic areas that are not covered by this project, and by adding the climate change dimension to its activities.

In addition, the below table shows the ongoing and new projects as of 2021:

Executing Entity	Donor	Project/initiative	Expected outputs	Budget	Status	Duplication risk/ complementarity
FAO	Swiss Agency for Development and Cooperation (SDC)	Improved Water Resources Monitoring System/Integrated Water Resources Management at regional level in Lebanon	<ul style="list-style-type: none"> Provide water monitoring systems and accounting tools to monitor water resources in the North Lebanon Water Establishment Support institutional decision-making and resources planning for IWRM and enhanced crop water productivity 	USD 2.43 Million	2019-current	No duplication risk. On the contrary, AgriCAL will benefit by liaising with FAO from these systems and accounting tools that would help institutions sustain the investments made by the project under component 1.
FAO	World Bank	Promotion of Good Agricultural Practices, Including Integrated Pest Management, to reduce agrochemical pollution in upper Litani basin	Promote, test and implement good agricultural practices including IPM programs	USD 1.5 Million (Loan)	2017-2021	No duplication risk. AgriCAL will explore potential knowledge exchange as part of the IPM demonstration plots that will be developed under component 2.
UN-Habitat	Adaptation Fund	Increasing the resilience of both displaced persons and host communities to climate change-related water challenges in Jordan and Lebanon	The project will focus on responding to climate change-related water challenges by taking a sustainable water management approach. This means it aims to reduce the demand of unsustainable water sources such as over-extracted (and often polluted) groundwater, while increasing water supply options from nonconventional and	USD 14 Million	2021-2025	No duplication risk. The project has similar focus on water harvesting and irrigation but focuses on urban

			more sustainable sources, incl. rainwater harvesting and the reuse of treated waste water.			communities rather than rural.
Horsh Ehden Nature Reserve	Global Environment Facility- Small Grant Program (SGP)	Adaptation measures to counterpart climate change effects on Biodiversity in Horsh Ehden Nature Reserve	Prepare an action plan adapted to insect pests that are increasing in Horsh Ehden Nature Reserve	USD 50,000	2018-2021	No duplication risk. AgriCAL will not work in nature reserves.
UNDP	Multi-Donor (SDC, GoG, BPRM, JPN)	Support to Host Communities in the WASH Sector	<ul style="list-style-type: none"> Construct concrete irrigation canals and networks in Anjar, Khirbet Qanafar, Chaat Younine, Ainata Hissa Samounié, Dahr Qonbar, Nahr Ibrahim, Khreybet Al Jundi, Khyem, and Hasbaya Rehabilitate irrigation canal and capacity building for on-farm irrigation and agricultural practices in Qab Elias Design an irrigation pond in Jezzine, Sir Al Denniyyeh/ Beqaa Sifirine 	USD 21.2 Million	2014-2023	No duplication risk. Despite similar activities, AgriCAL will contact UNDP to benefit from lessons learned on the management and sustainability of these infrastructure investments.
FAO	Global Environment Facility-Special Climate Change Fund (GEF-SCCF)	Smart Adaptation of Forest Landscapes in Mountain Areas (SALMA)	<ul style="list-style-type: none"> Reduce soil erosion, fragmentation of forest resources and biodiversity losses for more resilient forest and rural mountain forest communities Increase technical and institutional capacity at national level to replicate participatory climate proof forest management 	USD 7.4 million	2016-2021	No duplication risk. Forestry is not in AgriCAL's scope.
UNDP	Global Environment Facility	Land Degradation Neutrality of Mountain Landscapes in Lebanon	<ul style="list-style-type: none"> Conduct Landscape-scale survey of mountain lands and high country areas in Akkar and Jbeil Districts Restore degraded forests, high country grasslands, quarries and farmland in 2-3 pilot projects sites each Improve Land Use Planning process 	USD 641,660	2019-2024	Possible geographical overlap in Akkar but no duplication risk as Forestry is not in AgriCAL's scope.

UNDP	Global Environment Facility	Sustainable Land Management in the Qaraoun Catchment	<ul style="list-style-type: none"> • Undertake reforestation activities • Draft Strategic Masterplan, Strategic Environmental Assessment and Local Development Action Plans for Bekaa Governorate • Prepare guidelines for rangelands management and forest management • Initiation of Management plans for rangelands outside forests 	USD 3.5 Million	2016-2021	No duplication risk. AgriCAL will consult the guidelines for rangeland management that will be developed by the project to support the development of rangeland management plans under component 3.
FAO	International Climate Initiative (IKI) of the German Federal Ministry for the Environment, Nature Conservation and Nuclear Safety (BMU)/ South Korea/ Sweden	The Paris Agreement in action: upscaling forest and landscape restoration to achieve nationally determined contributions	<ul style="list-style-type: none"> • Enhance national and regional capacities to successfully plan, implement and monitor large-scale programmes mainstreaming Forest and Land Restoration (FLR) activities to achieve Lebanon's NDCs • Restore 5,000 ha of degraded forests and landscapes 	USD 900,000	2018-current	No duplication risk. Forestry is not in AgriCAL's scope.
FAO / UNIDO, UNDP, ILO, UNICEF and UN Women with support from the RCO	UN Joint Fund and Lebanon Recovery Fund (LRF) – Government of Canada	Productive Sectors Development Programme - PSDP	The Productive Sector Development Programme (PSDP) sits within the United Nations Strategic Framework's (UNSF) Outcome 3.1, which stipulates that the Government of Lebanon shall be assisted in "strengthening Lebanon productive sectors of the economy to promote inclusive growth and local development especially in most disadvantaged areas". It aligns with national priorities and complements the	USD 9.1 Million	Ongoing	No duplication risk. AgriCAL will explore with UN partners possible complementarity in common target areas and on policy advocacy and knowledge management.

			Government's Vision for Growth, Stabilization and Employment that was announced during the CEDRE Conference in April 2018, as well as relevant government strategies. In particular, the PSDP aligns with Lebanon's Economic Vision published in January 2019 by the Ministry of Economy and Trade which sets Agriculture and Industry (including agro-food) as priority sectors for government interventions.			
MADA	AFD and CCFD-terre solidaire	TAPSA-« Transition vers une agroécologie paysanne au service de la souveraineté alimentaire»	Promote a more sustainable agriculture and to validate an approach to support the emergence agricultural practices that respect the environment and allow quality agricultural production while optimizing natural interactions in Akkar.	N/A	Ongoing	Possible geographical overlap in Akkar but no duplication risk . AgriCAL will seek complementarity with the project on capacity building for good agriculture practices.
Lebanon Reforestation Initiative / Green Plan	EIIP / ILO	Employment creation and enhanced agricultural productivity through construction and rehabilitation of farm infrastructure	Support for farmers in 8 clusters with water reservoirs, reconstruction of walls and related infrastructure work	USD 4 Million	2021-2022	Possible geographical overlap but no duplication risk as the project is still in the inception phase. In AgriCAL, Green Plan is already implementing the water management component and will ensure that

						synergy occurs between the two projects to improve sustainability of AgriCAL's infrastructure interventions.
ESDU	EU	MedSNAIL Sustainable Networks for Agro-food Innovation Leading in the Mediterranean	MedSNAIL intends to tackle these issues by fostering the valorization and development of small-scale traditional agro-food value chains, combining enhancement of market potentialities and socio-environmental sustainability. Project activities will build on the well-established experience, principles and methods of SlowFood, an international grassroots organization promoting traditional food with a strong focus on biodiversity preservation.	USD 2 Million	2019-2022	No duplication risk. AgriCAL is not taking a value-chain approach unlike MedSNAIL.
DAI	USAID	Lebanon Industry Value Chain Development (LIVCD) Project	LIVCD Works to improve value chains in the olive, honey, grape, avocado, cherry and apple sectors. In addition, the project supports food processing of pickles, vinegar and freekeh (roasted wheat), a wide range of artisanal products and rural basket products, including thyme and pine nuts, and rural tourism activities to help ensure that economic benefits remain in rural communities.	USD 59 Million	Ongoing	No duplication risk. AgriCAL is not taking a value-chain approach unlike LIVCD.
Land O'Lakes	USAID	Lebanon Investment in Quality (LINQ) Project	LINQ partners with high-potential agribusinesses, processors, and growers of fresh produce to improve productivity, product safety, and quality, while creating	USD 59 Million	2018-2021	No duplication risk.

International Development			new market linkages to promote business and profit growth. LINQ develops 'acceleration plans' for its partners to identify the resources needed to overcome constraints and increase the income of program participants. These plans help identify the type of assistance required by each business, and may include technical assistance, investment grants, and employee training.			The project's focus is on business and SMEs development which is not within AgriCAL's scope.
UNIDO	UNIDO	CELEP - Community Empowerment and Livelihoods enhancement Project	Since 2011, UNIDO (in partnership with an Italian partner ICU) in close coordination with the Ministries of Industry and Agriculture has been working extensively on supporting growth and employment in the agro-industrial sector through the Community Empowerment and Livelihoods enhancement Project (CELEP)	USD 1.16 Million	Ongoing	No duplication risk. On the contrary, capacity building done by AgriCAL especially on processing focused on women and youth will benefit ILO's projects.
N/A	Swiss Embassy	Improve availability and access to nutritious food and/or support socially, environmentally and economically sustainable agricultural production in Lebanon	Supporting food security and nutrition in Lebanon	USD 200,000	Ongoing	No duplication risk. AgriCAL will seek complementarity with the project through the MoA.
FAO	FAO	Urgent Safe disposal of obsolete pesticides stocks in Lebanon	Technical assistance for the execution of urgent safe disposal of obsolete pesticides stocks in Lebanon	USD 350,000	Ongoing	No duplication risk. AgriCAL's scope does not include work on disposal of pesticides.

FAO	Norway	Prevention of Agrochemical Pollution in the Upper Litani Basin	Prevention of Agrochemical Pollution in the Upper Litani Basin	USD 678,218	Ongoing	No duplication risk. AgriCAL's scope does not include work on agrochemical pollution.
FAO	Norway	Rehabilitation and waste management of El-Bared Canal Irrigation System	Rehabilitation and waste management of El-Bared Canal Irrigation System	USD 999,899	Ongoing	No duplication risk. AgriCAL does not work in El-Bared canal.
FAO	Netherlands	Upgrading the technical agriculture education system in Lebanon	Upgrading the technical agriculture education system in Lebanon	USD 9 Million	Ongoing	No duplication risk. The project's objective is out of AgriCAL's scope.
FAO	UN Joint fund	Gender Responsive National Budgeting and Private Investing for SDG2-Zero Hunger	Gender Responsive National Budgeting and Private Investing for SDG2-Zero Hunger	USD 395,823	Ongoing	No duplication risk. AgriCAL can benefit from the lessons learned through its contact with FAO.
FAO	South Korea	Enhancing the Resilience of Vulnerable Refugee Communities through Cash-for-Work	Enhancing the Resilience of Vulnerable Refugee Communities through Cash-for-Work	USD 500,000	Ongoing	No duplication risk. AgriCAL does not use the cash-for-work modality and does not focus on refugee communities.
FAO	FAO	Emergency preparedness and response to strengthen capacities of NENA countries to mitigate the	Emergency preparedness and response to strengthen capacities of NENA countries to mitigate the risk of Fall Armyworm (FAW) in the region	USD 61,813	Ongoing	No duplication risk. It is a regional project where AgriCAL can benefit from the lessons learned

		risk of Fall Armyworm (FAW) in the region				through its contact with FAO.
FAO	Sweden	Implementing the 2030 Agenda for Water Efficiency/Productivity & Water Sustainability in NENA	Implementing the 2030 Agenda for Water Efficiency/Productivity & Water Sustainability in NENA	USD 235,400	Ongoing	No duplication risk. It is a regional project where AgriCAL can benefit from the lessons learned through its contact with FAO.
ILO	ILO	Business continuity, resilience and decent job retention in selected SMEs operating in the agriculture and agro-food sectors in Lebanon	Support to SME in bekaa and akkar	N/A	Ongoing	Possible geographical overlap in Bekaa and Akkar but there is no duplication risk. The project's focus is on business and SMEs development which is not within AgriCAL's scope.
N/A	EU	Boosting cross border Organic Ecosystem through enhancing agro-food alliances	Improvement of the organic sector competitiveness through the creation of a cross-border Organic Ecosystem supporting the development of business and SMEs in cooperation with public institutions.	USD 2.4 Million	2019-2022	No duplication risk. The project's focus is on business and SMEs development which is not within AgriCAL's scope.
Fair Trade Lebanon	US-MEPI	BIEEL - Support Business Innovation and Enhance Export for Lebanon	the project BIEEL aims at creating an environment which enables business development and empowers 100 Lebanese SME's and cooperatives by	USD 330,000	2020-2023	No duplication risk. BIEEL's focus is on export-oriented business

			increasing their competitiveness internationally			which is not within AgriCAL's scope.
FAO	European Union	Enhancing resilient livelihoods and food security of host communities and Syrian refugees in Jordan and Lebanon through the promotion of sustainable agricultural development	The grants will support: agricultural land reclamation, construction of concrete or earth water reservoirs, in addition to other complementary works such as retaining walls, modern irrigation systems, fences, planting of fruit tree seedlings, and vineyard trellises. The grant will cover part of the total costs of the related investments.	USD 5.48 Million	Ongoing	No duplication risk. AgriCAL will explore with FAO potential complementarity in potential common target areas and possibility to connect their beneficiaries to the early warning system.
Chemonics	USAID	Agriculture And Rural Empowerment (ARE) Activity	ARE develops rural economies in Lebanon through support to the agri-food sector and other industries to unlock local and export sales potential while also creating jobs and increasing farmers' and workers' incomes. The prioritized agriculture and non-agriculture value chains that ARE targets include: fresh and processed produce, dairy and fodder, stone fruits, table grapes, wine and arak, and tourism	USD 57 Million	Ongoing	No duplication risk. ARE focuses on value chains which is not part of AgriCAL's approach.
FAO	ILO through Netherlands	Voucher schemes to support vulnerable farmers	Voucher schemes to support vulnerable farmers	USD 220,000	Planned	No duplication risk. AgriCAL does not apply the voucher scheme.
ILO	Netherlands	PROSPECTS - Partnership for improving prospects for host communities and	In Lebanon, the ILO's focus in the PROSPECTS Partnership is on enhancing resilience of Lebanon's crisis-hit labour market and creating better livelihoods for both Lebanese host	N/A	2021-2022	Possible geographical overlap in Akkar and Bekaa governorates. No

		forcibly displaced persons	communities and Syrian refugees. It will do so by promoting the development of market-relevant skills, enhancing employment placement services and labour market governance, strengthening social protection schemes, and promoting micro, small and medium sized enterprises (MSMEs) and sectors with potential for decent job creation. Amongst other tools and approaches, the ILO will use its Approach to Inclusive Market Systems (AIMS) to unlock opportunities for decent job creation in the horticulture sector.			duplication risk as PROSPECTS focus on MSMEs which is not in AgriCAL's scope.
Fair Trade Lebanon	WFP	Agricultural Farmers Development And Livelihoods Project-AFDAL II	This project aims to improve sustainable livelihood opportunities for 1,150 vulnerable community members (including Syrian refugees and Lebanese community) in North and South Lebanon. AFDAL II strengthens competitiveness, quality, and productivity of small ruminants (Goat and Sheep) value chain, while addressing immediate food consumption of targeted households. The project provides trainings to enhance technical skills in food production, adapt new marketing strategies, and access markets. AFDAL II promotes agri-business development in value chain.	USD 100,000	2020-2021	Possible geographical overlap in south (Nabattiyah). No duplication risk due to different type of activities. However, there is a good opportunity to build on the trainings by AFDAL II for the community rangeland management plans to be developed by AgriCAL. AgriCAL already successfully collaborated with WFP on the

						networks of two hill lakes.
ILO	ILO	EIIP PHASE 4 - Employment Intensive Infrastructure Programme in Lebanon	Employment Intensive Infrastructure Programme in Lebanon	USD 17 Million	Ongoing	No duplication risk. AgriCAL thematic focus in different from this project's.
FAO	Belgium	Emergency livelihood support to the vulnerable small-scale farmers affected by the financial and economic crisis	Emergency livelihood support to the vulnerable small-scale farmers affected by the financial and economic crisis	USD 250,000	Ongoing	No duplication risk. AgriCAL PMU rooted in MoA will ensure synergy between the project livelihood activities as well as activities focusing on increasing resilience of smallholder farmers, IFAD COVID-19 recovery grant (RPSF) and other emergency/COVID-19 projects. AgriCAL will remain in constant contact with FAO during implementation. This will ensure that beneficiaries are not the same.
FAO	Lebanese Government	Emergency assistance to vulnerable greenhouse producers affected by the economic crisis and COVID-19 pandemic	Emergency assistance to vulnerable greenhouse producers affected by the economic crisis and COVID-19 pandemic	USD 1.49 Million	Planned	
FAO	Japan	Inc. resilience of vulnerable smallholder farming families affected by the economic crisis/Covid-19	Increasing resilience of vulnerable smallholder farming families affected by the economic crisis/Covid-19	USD 439,863	Ongoing	
FAO	Canada	Strengthening the resilience of vulnerable smallholder farm families affected by the economic crisis and COVID-19 pandemic	Strengthening the resilience of vulnerable smallholder farm families affected by the economic crisis and COVID-19 pandemic	USD 3.67 Million	Ongoing	

FAO	Lebanese Government through a loan from World Bank	Support to Farmers Affected by the COVID-19 and Financial and Economic Crises	Support to Farmers Affected by the COVID-19 and Financial and Economic Crises	USD 10 Million	Ongoing	
FAO	Canada	Support to Women Cooperatives and Associations in the Agri-food Sector of Lebanon	Support to Women Cooperatives and Associations in the Agri-food Sector of Lebanon	USD 4.98 Million	Ongoing	No duplication risk. AgriCAL will benefit from stronger women associations especially in component 3 on rangelands management.
UNIDO	UNIDO	CELEP phase 3 - Decontamination techniques for the Zaatar	CELEP phase 3 is a follow up that will focus on innovation and creativity. CELEP phases I to III improved the manufacturing capacities of a number of MSMEs and agricultural cooperatives and upgraded the quality standards of Lebanese products.	USD 100,00	Ongoing	Possible geographical overlap (in north, south and mountain Lebanon) but no duplication risk as AgriCAL's activities are not directly linked to MSMEs.

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

The transfer of knowledge generated through the project is crucial since AgriCal will be the first climate change adaptation project targeting the agricultural sector in Lebanon. The knowledge will include adaptation techniques at the farm level, best practices, early warning information, sound sustainable agricultural practices, and other policy recommendations and technical guidelines produced by the project.

The various trainings and knowledge generated from all project components will provide an integrated package for beneficiaries to guide them in improving agricultural resilience to climate change and productivity of their products.

The experiences of AgriCal will be documented and shared with all development cooperation partners as well as government institutions and local NGOs, Municipalities, and cooperatives. The M&E Knowledge Management Officer will be responsible for knowledge management and communication responsibilities in the PMU. The compilation and dissemination of project information will also be facilitated by the participation of IFAD in advising on, and backing up the project implementation. The IFAD Country Programme Manager will also be involved in sharing experiences of the AgriCal project through the various Governmental, Donor Coordination, UN and other organization functions. IFAD is a member of the United Nations Country Team (UNCT) and has taken part in the development of the United Nations Development Assistance Framework (UNDAF) that will monitor collectively the outputs and outcome of UN development efforts, the AgriCal project will be incorporated in future analysis and coordination functions of the UNCT.

The project's prolonged delay did not affect the project's knowledge management function. On the contrary, the project is aligning the best practices and lessons learned to feed into the current policymaking process in Lebanon. The reallocation was directly linked to the removal of output 4.1 that was focused on "climate index-based insurance initiated" that was cancelled for the mentioned reasons. Thus far, the project has produced two studies under the policy advocacy output. One is on the "Progress of adaptation measures in the agricultural sector" and this study was consulted to mainstream climate change adaptation in the newly developed Ministry of Agriculture Strategy (2020-2025). The same study was used to feed into the Nationally Determined Contributions (NDC) partnership plan as well as to update the current NDC. The other study is on "Synergies between Disaster Risk Reduction (DRR) and adaptation to climate change" which was also used to base the section on DRR in the updated NDC for Lebanon. Knowledge products are currently being produced including high quality videos. The remaining period of the project will witness the production of other knowledge products that capture lessons learned from the project. Moreover, the project will organise a national forum to all stakeholders on mainstreaming climate change adaptation in the different policies and disseminating the project results.

Regional knowledge networking

The project would be directly involved in the various supported IFAD regional initiatives which includes: (i) the regional network 'Knowledge Access in Rural Inter-Connected Areas' (KARIANET) that serves to link all ongoing projects to share knowledge and experiences in order to increase effectiveness of the project; (ii) the Capacity Building in Managing for Results and Impact (CaMaRI) launched recently to enhance capacity of monitoring and evaluation; and (iii) the ongoing relevant IFAD projects in the region.

H. Describe the consultative process, including the list of stakeholders consulted, undertaken

during project preparation.

In response to the request from the Government of Lebanon (GOL)'s Ministry of Agriculture (MOA), IFAD is resuming its financing of rural development projects in Lebanon. A draft project brief was developed by IFAD for an adaptation project in the agricultural sector in Lebanon based on consultations with MOA. This original project brief was shared and discussed with the main Government institutions. Accordingly the project brief has been developed into a concept note refined to ensure that the project responds to the priorities and needs of the country and the focus areas to respond to climate change by carrying out relevant adaptation activities.

Individual meetings were held with the Ministry of Agriculture and its relevant departments, the Ministry of Environment and its Climate Change Unit, the Green Plan and LARI.

Given that Lebanon currently lacks a national climate change coordinating committee, it was necessary to approach key stakeholders individually and not through an overarching institutional arrangement. Nevertheless, the Ministry of Environment as UNFCCC Focal Point played a key role in providing initial guidance for the project formulation team.

As the executing entity for the proposed project, the Ministry of Agriculture is a primary stakeholder and is playing an important role in guiding the development of the project document.

A national consultation workshop was organized in February 2012 where key stakeholders were provided with the draft project proposal, and their inputs on specific elements of the project were integrated into the final draft. (Annex 1)

Consultations at the local level have also been conducted in the three geographical areas where the project will be operating. These consultations mainly included the farmers' groups to identify their main challenges, their needs and type of technical support to be provided by the project partners (IFAD, MOA, Green Plan and LARI). The support efforts needed for them to better adapt to climate change were also identified. This needs assessment was captured by AgriCAL where the needed support fell within the scope of the project, and otherwise was taken up by the partners for the inclusion in their development activities. In addition, within the UNDP TNA Project, stakeholders and farmers at the local level were consulted to identify the most relevant adaptation techniques required to be promoted and implemented in the rural agricultural areas. The result of this survey was also captured, and was the basis for the selection of the technologies selected by AgriCAL. The assessment provided a list of measures for adaptation as follow:

For agriculture: conservation agriculture, selection of adapted varieties and rootstocks, good agriculture practices, integrated pest management, integrated production in greenhouses and early warning systems.

For water: rainwater harvesting from hill lakes, rainwater harvesting from roads, rainwater harvesting from greenhouse tops, soilless culture, early warning system through snowpack monitoring, water efficient use irrigation systems, water user association and reuse of treated wastewater.

During a validation workshop was held in January 2012, 3 technologies per sector were prioritized. The selected technologies or measures for adaptation were: i) rainwater harvesting from greenhouse tops, ii) rainwater harvesting from roads and iii) water users association, for water sector. As for agriculture, the prioritized technologies were: i) conservation agriculture, ii) selection of adapted varieties and rootstocks and iii) good agriculture practices.

Green Plan, which is responsible for the implementation of component 1 of the AgriCAL project, has adopted the two measures related to water harvesting, and therefore these were included in the activities that will be undertaken.

LARI, which adopted a series of measures including: conservation agriculture, selection of adapted varieties and cultivars, early warning system linked to integrated pest management and irrigation water monitoring, has validated them through a consultation workshop with farmers held in Baalbeck in the Bekaa valley.

The national fodder resources assessment and the activities related to it emerged from the need of the Ministry of Agriculture to assess its rangeland resources, and undertake a sustainable rangeland management in state and communal lands, that are under the mandate of the ministry. In addition, natural ecosystems, including rangeland and small ruminants, depending on these grazing areas were also found vulnerable to climate change, and validated by the concerned stakeholders in the validation workshop under the Second National Communication to Climate Change.

Moreover, and as a follow-up to the national consultation meeting in February, UNDP and the Ministry of Environment organized a coordination meeting on 11 April 2012 with all national stakeholders to present the ongoing and planned climate change adaptation activities, including the activities that AgriCAL will be working on. The meeting served concurrently as a coordination meeting to share initiatives and achievements of institutions and a consultation meeting to promote complementarities as well as identify the barriers and the enabling framework for the deployment of the technologies selected under the Technology Needs Assessment (TNA) including: Rainwater Harvesting from Greenhouse tops and Roads, Conservation Agriculture, Select Adapted Varieties and Rootstocks, Risk-Coping Production Systems and Water User Associations.

The project went through an IFAD Quality Enhancement (QE) process where a group of experts expressed their technical views towards making the project more viable and technically solid. All the comments of the QE process were integrated into the final project document.

In October 2021, IFAD conducted another round of stakeholder consultations as part of formulating IFAD's Country Strategy Note (CSN) for Lebanon (2021-2023) and to ensure the alignment of the project changes with the current context. The consultations helped the project shape the changes as it verified the country's main environmental and climate challenges; its adaptation priorities; methods being used by smallholder farmers to cope with the current climate and economic context; and activities that could benefit the most vulnerable groups (e.g. women and youth). The results of the consultation confirmed the relevance of the project and the significance of its adaptation benefits to the agriculture sector in Lebanon.

The consultation occurred through a written questionnaire and involved the following stakeholders: FAO, UNEP, UNOPS, UNICEF, University of Balamand, Lebanese University- Life and Earth Sciences, Prime Minister Office for Strengthening DRM Capacities in Lebanon, Ministry of Agriculture, Lebanese Agricultural Research Institute (LARI) and Lebanon Reforestation Initiatives (LRI). In addition, IFAD and the PMU at the Ministry of Agriculture carried out extensive discussion with the Ministry of Environment to ensure project's relevance and the importance of the proposed changes in achieving the project's objectives. IFAD also had separate meetings with the IUCN and UN Women as part of the environmental and social risk screening process.

The findings of the stakeholder consultations were validated by the outcomes of the most recent community consultations carried out by the project. The shepherds consulted as the main beneficiary groups for component 3 agreed that improved pastoral management will reduce trespassing and thus supported the project's planned interventions. Although they had different views on who are the stakeholders for pastoralism, there was a consensus that all stakeholders including at village level

are involved in the implementation. They pointed out the risk of excluding women and youth specially that youth are becoming more and more involved in the pastoralism community. All the communities consulted in Ras Baalbak and Kaa- men and women- agreed that AgriCAL's approach to reduce flood risk will be very efficient and will help them adapt to flash floods but "expressed their concerns about potential inadequate supervision during construction activities or lack of maintenance on the longer term.

The majority of consulted communities in Ehmej, Barqua and Al Zrazir hill lakes agreed that these networks will help them with their agricultural activities especially in a declining water availability context. In the three hill lakes, beneficiaries have already been in touch with the respective municipalities with regards to the management, operation and maintenance arrangements of these networks so as not to create conflict between beneficiaries.

The findings helped with the formulation of the proposed changes to AgriCAL and fed into the assessment of potential risks related to the 15 principles of AF's ESP including gender specific risks. The discussions helped the team update the ESMP.

More details on the 2021 consultative process is in Annex 1.

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

Under the adaptation alternative, an integrated response will be developed to manage climate risks to agriculture in the three focus areas. Project activities will target vulnerable communities in order to unlock agricultural development opportunities through the improved management of water and rangelands, and enhanced agricultural practices. The baseline situation and adaptation alternative per project outcome are presented below:

Outcome 1: Increased water availability and efficient use through water harvesting technologies

Baseline:

Currently MOA and GP with the support of IFAD are working on increasing water harvesting in several areas in Lebanon, through the construction of hilly water lakes and ponds. However water harvesting from greenhouses and agricultural roads is not being invested in, in spite of their high potential and relatively low cost. In addition, at the farm level, farmers still rely on rain fed agriculture, and on ground water for irrigation without considering water-harvesting options.

The most used greenhouses in Lebanon are the round arched tunnel greenhouses that have the following disadvantages compared to the Single Span Greenhouses (SSG): The net greenhouse floor area that fits for plant cultivation is small; the plastic-film consumption is higher; ventilation efficiency is not sufficient; extra cost for the control of Tuta absoluta because of the inefficiency of the anti-insects nets; the extra use of Plastic, Pesticides, and Fuel makes this type far from being environmentally sound; lower productivity of Arched Tunnel type greenhouses (ATG); arched type in best cases produce 25% less than SSG, this production lost can easily overpass 40-50%. The ATG greenhouses are also the most affordable which given the economic crisis is a significant factor to be considered.

Adaptation alternative:

The project will support farmers with demonstrations in the wider Byblos area for rainwater harvesting on both types of greenhouses: SSG and ATG. The main aim of the demonstration is to promote water harvesting and reducing water insecurity on all types of greenhouses, especially given the economic crisis by tailoring the demonstrations to the more vulnerable farmers through the inclusion of the more affordable ATG greenhouses.

In addition, other practices to be promoted by the project include technologies that increase rainwater infiltration and storage in the soil for crop use, and run-off storage for supplemental irrigation using storage structures such as farm ponds, earth dams, water pans and underground tanks.

While demos will be targeted at reducing water insecurity, the inclusion of the SSG demos for those farmers able to afford them, will have the added benefit of being needing reduced pesticides and fertilizers, better soil organic matter; socially- better quality of life for farmers (reducing cost of inputs and less contact with pesticides), healthier quality of food, better hygiene and safety working conditions, economically- more income due to better quality and less cost, better efficiency per unit area.

Despite the proposed cancellation of rainwater harvesting from roads due to the reasons mentioned below, this component will still achieve its adaptation benefits. The recent stakeholder and community consultations revealed that a combination of installing networks from rainwater harvesting hill lakes and on-farm modern irrigation systems will yield the greatest increase in the adaptive capacities of farmers to climate-induced water scarcity. The downscaling of rainwater harvesting from greenhouse rooftops to only pilots is necessary as most of the farmers in the target area owns greenhouses, the sustainable greenhouse demonstration plots will ensure wider dissemination beyond the target areas and higher rates of adoption of this technology. The pilots will also be used for knowledge management and policy advocacy purposes by the Ministry of Environment. This will still bring adaptation benefits at the national level.

Outcome 2: Increased adaptation to climate change for crop production

Baseline:

LARI is currently conducting some activities to support farmers in enhancing their agricultural practices and productivity namely through: production of quality seeds, diagnosis of animal diseases, production of vaccines, food quality control, soil analysis, feed composition, plant protection and others. In addition, LARI operates a network of weather stations covering most of the Lebanese territory. LARI is well aware of the climate change scenarios and their potential impact on agriculture in Lebanon. However, for LARI to expand its research and extension activities to cover climate change issues, it is in need of additional technical and financial support.

Adaptation alternative:

The project will directly support LARI in enhancing its capacity to deliver climate-smart technology for enhanced agricultural production. This will be developed and disseminated by means of enhanced extension services and direct training to local institutions and farmers. A range of climate-resilient agricultural technologies and methods will be developed and transferred to farmers e.g. drought- and disease-resistant varieties, integrated crop-livestock production systems, conservation agriculture, enhanced rangeland management, and others.

The early warning system linked to IPM and water management as well as good agriculture practices, will enable farmers to be more efficient in terms of inputs usage (chemicals and water) and labor. Savings may reach more than 30% of the cost of production. The current measures such as following an annual calendar will increase not only the cost, but will be less efficient and make crops more vulnerable to climate variability and pest outbreaks.

The fodder resource assessment will enable the establishment of a rangeland managerial scheme that will promote adaptive grazing practices to climate variability and preserving natural resources.

Outcome 3: Increased resilience of shepherds and small ruminants to climate change through sustainable rangeland management

Baseline:

Although rangelands form a very important part of the agricultural production system in Lebanon, and they are the most vulnerable to climate change and desertification, MOA does not have ongoing programmes to manage rangelands, and development partners are also not investing in this field. Currently, rangelands are being used by herders without acknowledges guidelines or regulations. Ad hoc measures are being taken by local authorities and community groups in some locations. Degradation of rangelands is being observed caused by natural (climate effects, floods, drought, etc.) and man-made (over-grazing, desertification, etc.) factors.

Adaptation alternative:

The project will be the first project to support MOA in addressing climate change effects in the rangeland ecosystems in Lebanon. The project will undertake a national assessment of the rangelands, and will target its activities in the three project focus areas by providing improved soil management techniques, limit erosion and improve water and nutrient efficiency, thereby contributing to adaptation. Rangelands also support reduced NO₂ emissions and carbon sequestration, improved feed resources.

Outcome 4: Policy influenced and lessons learned and shared through a knowledge management system

Baseline:

While policy makers and planners are becoming more aware of the importance of an enhanced response to climate change, Lebanon has not yet developed a national climate change policy or action plan. While at the national level, people are aware of the increasing climatic variability that is negatively affecting the environment and eventually their livelihoods, they still consider that this is a global issue that is hard to be tackled at the local level.

Despite progress, there remains a lack of understanding of the sectoral and development implications of climate change effects in line ministries. This is an underlying cause of the current situation, in which climate change in general and adaptation in particular is not mainstreamed into development planning processes. This is the case both nationally and in the regions. Currently there is little collated information available on climate-related risks in the agricultural sector, either at the national or local levels. Information about climate change-related risks is often missing, and when present, its management and dissemination is not carried out systematically, which further also militates against an effective response. Moreover, any lessons learned are not being captured in a way that facilitates broader sharing, to enhance awareness and influence policy.

Adaptation alternative:

The project will have a strong learning and knowledge management component to capture and disseminate lessons learned and to influence policy. The knowledge management system will be institutionalised within MOA and linked to relevant Governmental and research institutions. Lessons will be shared through various appropriate national and regional networks. The knowledge management system will focus on targeting policy makers at the national level, to facilitate uptake of lessons learned into policy.

While the removal of output 4.1 “climate index-based insurance initiated” will not allow for an climate-based insurance system for farmers, the adaptation benefit of providing early warning information is still going to be achieved under outputs 2.1 and 2.2. Instead, this component now focuses more on policy advocacy and has been already successfully contributing to the climate policymaking process in Lebanon. The studies are directly linked by the Ministry of Environment to sectoral policies and knowledge products will help disseminate best practices and lessons learned. The planned national forum will guarantee that all stakeholders play a role in the climate change adaptation process in the country. Details of the achievements under this component so far are under section G.

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

The sustainability of the two pilots for rainwater harvesting from greenhouse roof tops is guaranteed through a maintenance, free viewing access to other farmers, and non-removal contract between the two selected farmers and MoE. There are clear incentives for operation and maintenance for the two farmers and thus high sustainability prospects because the institutional set-up is simple with no collective action required. The main incentive in this case is providing the two farmers with the greenhouse water harvesting structure and equipment. The project will also pursue a written memorandum of understanding with the two farmers to formalize operation and maintenance arrangements and guarantee a minimum period (e.g. 5 years) for demonstration to other farmers and time slots of being open to other farmers. The main details of the MoU has been agreed with the two farmers, which would include the estimated annual maintenance costs that will not exceed around USD 300 per year (see detailed maintenance fees in the table below). The free access for demonstration has also been agreed on, with no limitation on the number and timing of future onsite demonstrations. The two farmers were selected mainly based on willingness to host the pilots, operate them and sustain them. They also land size that is less than 3,000 m² with two different types of cultivation (cut flowers at Bentael and vegetables at Ryhane) at two different altitudes (coastal at Ryhane and Mounteneous at Bentael).

<u>Ryhane</u>	<u>Bentael</u>
<u>Green house polyethylene sheet: 1112m² x 0.8 \$/m²= 889.6\$ over 3 years</u>	<u>Green house polyethylene sheet:</u>
<u>Yearly maintenance : 296.53 \$</u>	<u>1053 m² X 0.8\$/m² = 842.4\$ over 3 years</u>
	<u>Yearly maintenance: 280.3\$</u>

To address sustainability concerns around the water networks, Green Plan will provide institutional capacity development including technical capacity building and support to the water committees and Water User Associations (WUAs). This is noting that 10 out of the 12 hill lake networks will be managed by the municipalities who are well capacitated in terms of financial and maintenance follow up. The remaining two networks will be managed by WUAs and Green Plan will ensure adequate capacity building and ongoing support to the two WUAs. The project will also cooperate with relevant municipalities and WUAs to agree on the fee to be charged to the beneficiaries for the provision of the irrigation service to ensure proper operation and maintenance of the networks. Although not yet formalized, the estimated fee will be around USD 0.25 per cubic meter, which translates to around USD 100 per beneficiary per year. This is based on an estimated average of 400 m³ of water needed per beneficiary during the two cultivation seasons of the year. This will produce an average of USD 7,000 annually for each hill lake network for maintenance and management. This will ensure the sustainability of this sub-component.

Output 2.2 was designed to ensure the sustainability of output 2.1 through proposing the most appropriate financial mechanism to the early warning system. It involves different parties including public and private sector actors. The financial sustainability of the system will enable up-scaling it to all farmers nationwide. The AgriCAL project was successful in driving a Public Private Partnership (PPP) between LARI and Debbane Company which is the local agent of Pessl, the manufacturer of the weather stations currently used by LARI all over the country. Debbane will provide LARI with Agrometeorological services at a fraction of the cost for 5 years in return for advertising rights in the EWS smartphone application. This agreement will ensure sustainability of the EWS for at least the coming 5 year, if not longer, in the event of the renewal of the agreement by both parties. The success of the PPP reduced the cost of this output from USD 100,000 to USD 25,000. The USD

25,000 is dedicated to a consultant who will develop a comprehensive private sector strategy that will ensure sustainability and further partnership with other interested private sector entities.

Rangeland interventions sustainability is relying on the participatory approach taken to develop the rangeland management plans that ensure community ownership. Protecting rangelands from overgrazing and flooding will bring great economic benefits from the ecosystem services provided. In addition, a reduction in the theft of animals and potentially a reduction in social conflicts around trespassing will ensure the sustainability of the targeted rangelands. Income generating activities and fodder provision will compensate shepherds for the time needed for restoration of rangelands. Capacity building for the MoA staff will ensure proper oversight of the implementation of the rangeland management plans and management of the nursery.

Components 2 (especially 2.3. and 2.4) and 4 are expected to create a knowledge base that would ensure the sustainability of AgriCAL's investments as a whole. Capacity building, demonstrations and pilots will increase the resilience of communities through possessing technical knowledge on adaptation to climate change. The guidelines produced on climate change adaptation techniques in agriculture by LARI will enhance the knowledge of the different rural institutions and would also be useful in the academic circles. Ministry of Environment's knowledge management activities will contribute to wider dissemination of the knowledge created by the project and thus will contribute to the ongoing policy processes in the country (e.g. NAP and NDC) for upscaling of AgriCAL activities. The planned capacity building activities in addition to the guidelines are expected to increase farmers' yields by approximately 15% as envisaged in the original design document. Costs of production are also expected to be reduced by an average of approximately USD 624/ha per year (i.e. USD 62.4 per Dunam).

More details on the sustainability of the aspects is in the table below.

Output/Activity	Sustainability Aspects				Responsibility
	Economic and Financial	Social	Environmental	Institutional	
1.1 Rainwater harvested from greenhouse roof tops	Formal operation and maintenance arrangements will be included in an MoU between the MoE and the two farmers selected for the pilots. The MoU will ensure that the two pilots are maintained for demonstration to other farmers.	The MoU with the two farmers will include details on time slots for demonstration and will ensure free viewing access by other farmers with no exclusion or favouritism. Thus the two pilots are expected to create higher awareness on water-use efficiency.	Rainwater harvesting from greenhouse roof tops is an innovative on-farm technique to collect water for supplementary irrigation. Wider adoption is expected as a result of the two demonstration pilots locally and the advocacy by the MoE which will bring significant environmental benefits.	The two pilots were requested by the MoE and so the institutional ownership is guaranteed. MoE is already using the pilots for policy purposes and created a short video about them for dissemination.	MoE and the owners of the two pilots.
1.2 Improved access to climate-resilient water resources	The project will cooperate with relevant municipalities and	The risk related to access and equity is low (see principle 2).	The water networks from the hill lakes will allow	Green Plan will provide institutional capacity	Green Plan, WUAs, Water Committees.

<u>& Water efficient irrigation systems deployed</u>	<u>WUAs to agree on the fee to be charged to the beneficiaries for the provision of the irrigation service to ensure proper operation and maintenance of the networks. Beneficiaries of three hill lakes have confirmed that they are already in contact with the municipalities regarding the fees.</u>	<u>The reallocated budget will allow all farmers around the all the hill lakes to have access to drip irrigation and so conflicts are unlikely to arise. Capacity building of water committees and WUAs will ensure maximum cooperation on the operation of the networks.</u>	<u>communities to benefit from harvested rainwater. A total area of 262 ha will be more climate-resilient and the drip irrigation will allow all 698 farmers to make efficient use of water in the increasingly water-scarce context of Lebanon due to climate change.</u>	<u>development including technical capacity building and support to the water committees and WUAs.</u>	<u>and relevant municipalities.</u>
<u>2.1 Enhanced early warning system to farmers through improved existing system</u>	<u>Medium term (5 years): Debbane (a private sector company) will provide LARI with Agrometeorological services for 5 years in return for advertising rights in the EWS smartphone application.</u> <u>Long term (after 5 years): A private sector engagement strategy will be developed by the project to provide a roadmap for partnership with the private sector on the longer term.</u>	<u>Sensitization of communities to early warning systems will allow for appropriate auctioning and high appreciation of the beneficiary farmers and there is an increased demand. Farmers feel the climate change impacts already and are in need of timely digital extension which the EWS is part of.</u>	<u>The Early Warning System will contribute to climate smart agriculture as information from LARI would help farmers cope with climate change impacts. The other outputs under component 2 including the capacity building, demonstrations and guidelines would ensure that early warning knowledge will be applied.</u>	<u>LARI is committed to continue providing the EWS service mainly through the operation and maintenance of the meteorological stations and the processing of information. The partnership with the private sector will ensure that the service continues beyond the project's lifetime.</u>	<u>LARI and Debbane</u>
<u>3.1 Community-based sustainable rangeland management plan prepared</u>	<u>The rangeland management plans will ensure that the rangelands are capable of providing the ecosystem services that have economic significance to these areas. The project's proposed feed provision and income-</u>	<u>The participatory approach ensures that the rangeland management plans will be owned by the communities. Consultations have shown that youth are increasingly involved in the sector and so have an opportunity to</u>	<u>The rangeland management plans will ensure that rangelands in Nabatia will be allowed to recover and will prevent overgrazing in the future.</u>	<u>The technical staff of the Directorate of Rural Development and Natural Resources (DRDNR) will be trained to implement sustainable rangeland management plans. The managerial scheme will be</u>	<u>DRDNR and targeted communities.</u>

	<u>generating activities will also contribute to an increase in income that would compensate some of the households for the time of rangeland restoration.</u>	<u>lead the monitoring of these plans. Income-generating activities will focus on youth and women as the main beneficiaries.</u>		<u>elaborated to ensure the involvement of the local communities in the rangeland management plans, which should result from community-based decisions.</u>	
<u>3.2 Restored degraded rangeland areas and reduced flood risks</u>	<u>The income generated by the nursery will contribute to diversifying the income that is mainly relies on the livestock sector and would compensate some of the households for the time of rangeland restoration.</u>	<u>The participatory approach ensures that the rangeland management plans will be owned by the communities. Communities around the nursery will be the main beneficiaries and will benefit economically. The ESMP has included the risk of plants being stolen from the nursery and AgriCAL will accordingly work with communities on a community-led mechanism for the protection of the nursery.</u>	<u>Flooding has been identified by communities around rangelands as an increasing risk due to climate change. The flood-risk management measures proposed will enhance adaptation and increase the resilience of those communities to climate change. In addition, Plantation efforts- once nursery is producing- within 3 years on degraded rangelands in will reduce further deterioration of vegetation cover and prevent erosion.</u>	<u>Training concerned staff for fodder species identification, harvesting seeds, and multiplication and plantation techniques will ensure that the knowledge with MoA is adequate to ensure sustainability of the nursery. This will be combined by applying the measures outline in the rangeland management plans for rangeland protection.</u>	<u>MoA</u>

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

AgriCAL's main objective is to increase community resilience and adaptive capacity to climate change in Lebanon. The objective is to support the implementation of climate change adaptation measures in the agriculture sector in three highly vulnerable focus areas. However, there are risks that are associated with the project activities especially as changes occurred to some activities mainly due to the prolonged execution duration. To ensure compliance with the AF ESP, all project activities (including the ones involving changes) have been screened against the 15 AF principles to identify potential environmental

and social risks and to assess related potential impacts. Where risks have been identified, measures to mitigate risks have been integrated into the ESMP with the appropriate monitoring mechanisms. Data and analysis were provided based on collected disaggregated data focused on identification of climate change related needs, risks, constraints and requirements specific for marginalized and vulnerable groups especially of women and youth. Activity formulation and the identification and verification of potential risks and impacts have been done with project beneficiary groups through surveys and on-field meetings.

<u>Checklist of environmental and social principles</u>	<u>No further assessment required for compliance</u>	<u>Potential impacts and risks – further assessment and management required for compliance</u>
<u>ESP 1 Compliance with the Law</u>	<u>x</u>	<u>No risk.</u>
<u>ESP 2 Access and Equity</u>	<u>x</u>	<u>Low risk.</u> <u>There is some risk related to access to irrigation water from the hill lakes especially for farmers downstream. In addition to the networks established from the hill lakes, the project will invest in drip irrigation equipment to increase water-use efficiency which might create conflict for some farmers who are not selected for drip irrigation. To address this risk, community consultations took place with project beneficiaries for each project activity / output to identify possible rivals, disputants and concerns related to equal access of project benefits. The reallocations made to component 1 allows AgriCAL to provide equal access to all 698 beneficiaries for on-farm irrigation so as not to create any conflict within the community. The risk and the mitigation measure were incorporated into the ESMP.</u>
<u>ESP 3 Marginalized and Vulnerable Groups</u>	<u>x</u>	<u>No risk.</u>
<u>ESP 4 Human Rights</u>	<u>x</u>	<u>No risk.</u>
<u>ESP 5 Gender Equity and Women's Empowerment</u>	<u>x</u>	<u>Low risk.</u> <u>As noted in the gender analysis, gender imbalances persist in for example access to good quality education, political participation and social participation. The Lebanese economic downturn has and will likely further exacerbate gender inequalities in the country. To ensure that the project will have a positive impact on the empowerment of women, the project includes gender sensitive planning and implementation methods as further detailed per component in the gender matrix. The ESMP also includes measures to ensure taking gender concerns into consideration.</u>
<u>ESP 6 Core Labour Rights</u>	<u>x</u>	<u>No risk.</u>

<u>Checklist of environmental and social principles</u>	<u>No further assessment required for compliance</u>	<u>Potential impacts and risks – further assessment and management required for compliance</u>
<u>ESP 7 Indigenous Peoples</u>	x	No risk.
<u>ESP 8 Involuntary Resettlement</u>	x	No risk.
<u>ESP 9 Protection of Natural Habitats</u>	x	No risk.
<u>ESP 10 Conservation of Biological Diversity</u>	x	No risk.
<u>ESP 11 Climate Change</u>	x	No risk.
<u>ESP 12 Pollution Prevention and Resource Efficiency</u>	x	No risk.
<u>ESP13 Human Health</u>		<p><u>Low Risk.</u></p> <p>The COVID-19 global pandemic continues to threaten the health sector around the world. Project activities that involve community mobilization, meetings, workshops or stakeholder participation may pose a threat of widespread infections. The project will continue to monitor the situation as it has done in 2020 and 2021 taking all the safety precautions in alignment with WHO guidelines and all the national guidance on the matter. Where relevant and without undermining the project's objectives, the PMU will use online tools for meetings and consultations to the extent possible.</p>
<u>ESP 14 Physical and Cultural Heritage</u>	x	No risk.
<u>ESP 15 Lands and Soil Conservation</u>	x	<p><u>Low risk.</u></p> <p>The project ensures that no negative impacts on lands and soil will result from project activities- including the proposed changes. No areas of fragile soils or valuable lands have been identified among the target areas. No major excavations will take place.</p> <p>On the other hand, the proposed interventions under component 3 may pose some risk on the land around the targeted watershed. The Installation of hafeers, stone check dams, gabions and contour line walls may have a negative impact on land as a result of the construction works involved. This may impact the land's ability to provide its ecosystem services around watersheds. However, the project will ensure that all the construction works follow the</p>

<u>Checklist of environmental and social principles</u>	<u>No further assessment required for compliance</u>	<u>Potential impacts and risks – further assessment and management required for compliance</u>
		<u>Environmental Impact Assessment Process supervised by the Ministry of Environment as integrated in the ESMP. Consultations with communities in these areas concluded that flood risk management is an absolute priority to protect the rangelands and thus these interventions are required. The development of the rangeland management plans will ensure the sustainability of these interventions and the involvement of communities in decision-making.</u>

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PART III: IMPLEMENTATION ARRANGEMENTS

A. Describe the arrangements for project implementation.

Upon the request of the Government of Lebanon, IFAD is the Multilateral Implementing Entity (MIE) for the project. The project is nationally implemented in line with the IFAD procedures and guidelines as agreed upon with the Government of Lebanon through the Ministry of Agriculture. While IFAD is the MIE for the Project, the Ministry of Agriculture (MOA) is the government institution that will act as the Implementing Partner/Executing Agency. While MOA will be responsible for overall project implementation and will be the project executing entity, GP and LARI will be a major partner under the components 1 and 2 respectively.

The project will work with the following main partner entities:

Ministry of Agriculture (MOA), the MOA is responsible for the formulation and implementation of agricultural development policies and strategies in the various regions of the country. The MOA has implemented several donor funded projects, mostly through grants. This includes technical assistance projects from various multilateral and bilateral sources.

MOA will undertake the overall management and coordination of the project, host and supervise the PMU, and implement Outcomes 3, 4 and 5 in full cooperation with GP and LARI.

The Ministry of Environment (MOE) is the main governmental body concerned with environmental issues in the country. It was established in 1993 under Law 216/93 to meet Lebanon's environmental challenges, and articulate environmental policy principles and strategy objectives. In the past few years, the MOE has demonstrated its ability to steer project activities towards successful implementation and within the overall strategic objectives of the Ministry.

MOE is the national focal point institution for the UNFCCC as well as the Adaptation Fund. MOE has prepared the Lebanon's Second National Communication (SNC) to the UNFCCC in February 2010. The SNC analysed the climate change scenarios for Lebanon and identified the adaptation measures that need to be implemented to enhance the country's resilience to climate change. MOE has endorsed AgriCal project proposal as a highly relevant and needed initiative to enhance the resilience of the agriculture sector and help implement the adaptation plan for Lebanon. MOE will take part of the Project Steering Committee of the project.

The Council for Development and Reconstruction (CDR) is a government agency with a key role in the reconstruction and economic recovery, and is responsible for formulating and monitoring implementation of public investment projects. The CDR is also directly responsible for implementing a large part of the reconstruction programme. In this capacity it acts in coordination

with various institutions, principally relevant ministries that will ultimately operate and maintain the investments. Recently, CDR has taken a significant step towards social and economic development and in cooperation with several governmental and international agencies, has planned and coordinated several projects that aim to raise the living standards of marginalized groups leading to significant changes at the national level. CDR will take part of the Project Steering Committee of the project.

Green Plan (GP), was established in accordance with Law No. 13335, on 10 July 1963 as an autonomous authority under the auspices of the MOA. The GP's mandate is to study and execute land reclamation and development projects. Its activities include land reclamation, improving and building agricultural roads, building concrete water tanks and earth reservoirs for irrigation, constructing stone retaining walls and terraces, installing on-farm irrigation systems and providing fruit trees and plants in addition to other related activities.

GP will implement Outcome 1 of the project in-line with its mandate and in full cooperation with MOA and LARI.

The Lebanese Agricultural Research Institute (LARI) is an autonomous public institution under auspices of the MOA. LARI has a number of very good core facilities and activities which are capable of providing key services to agricultural producers and those involved in the marketing and export of agricultural products. LARI has also been given a remit to provide extension activities, mainly for dissemination of research results. From 2001, LARI has been moving towards a demand driven approach in undertaking practical research with farmers and related extension activities.

LARI will implement Outcome 2 of the project in-line with its mandate and in full cooperation with MOA and GP.

The International Fund for Agricultural Development (IFAD), in line with the operational policies and guidelines for accessing the Adaptation Fund, IFAD's role as a multilateral implementing entity will support eligible countries in accessing resources for concrete agriculture-related adaptation projects and programmes aiming to reduce the risks and impacts of climate change on smallholders and their associated livelihoods. IFAD has recently established its Environment and Climate Division and produced its Climate Change Strategy and its Environment and Natural Resource Management Policy, thus enhancing the role of IFAD as bridging the nexus between poverty alleviation, natural resource management and climate change adaptation.

IFAD's added value as a multilateral implementing entity lies in its rural poverty focus and its expertise in addressing climate change challenges at the local level. IFAD's services as a multilateral implementing entity would be of relevance to countries that have not yet nominated a national implementing entity such as Lebanon.

In this respect, IFAD is well positioned to drive Adaptation Fund investments around the key adaptation objective of increasing food security and reducing the vulnerability of smallholder farming systems and rural livelihoods.

Accordingly, IFAD is responsible for providing a number of key general management and specialized technical support services to the project. These services are provided through IFAD's Country Programme and the Climate and Environment Unit and include assistance in: project formulation and appraisal; determination of local capacity assessment; briefing and de-briefing of project staff and consultants; general oversight and monitoring, including participation in project reviews; receipt, allocation and reporting to the donor of financial resources; thematic and technical backstopping; provision of knowledge transfer; research and development; participation in policy negotiations; policy advisory services; programme identification and development; identification and consolidation of learning; and training and capacity building.

IFAD will carry out the fiduciary aspects and implementation support functions. The project will be directly supervised by IFAD. The supervision missions will be implemented bi-annually. The composition of the mission in terms of technical expertise will be based on the annual supervision plan. The supervision plan will highlight in addition to the routine supervision tasks, the main thematic or performance area that requires strengthening and would imply deployment of additional inputs of capacity building, in-depth analytical studies or review of existing policies.

Technical partners in implementation

Private consulting engineering firms and contractors would be the key implementing partners for planning, design and construction of infrastructure systems funded under the project. Qualified consulting engineering and construction firms are widely available in the country.

Project coordination and management

The project will have the same **Project Steering Committee (PSC)** as the HASAD project, which is presided by the Minister of Agriculture. It will be responsible for the review of the Annual Work Plans and Budget (AWPB) and results achieved by the project and, more generally, facilitating and supporting project implementation. Members of the PSC would include representatives from the CDR the Director General of MOA, the President of the GP Executive Committee, and the Director General of LARI. The Ministry of Environment will be invited to become a member of the PSC given its role in the implementation of the UNFCCC in Lebanon.

The Ministry of Agriculture (MOA) would be the Lead Project Agency (LPA) responsible for the project. The overall project management and coordination would be the responsibility of a Project Management Unit (PMU) located at MOA under the supervision of the Minister of Agriculture, since the bulk of the project works and expenditures are under its mandate. The MOA has prior experience with financing from IFAD and other international lending agencies (World Bank), including direct handling of procurement and disbursement matters. MOA will organize the recruitment of the PMU Staff following competitive procedures.

The **Project Management Unit (PMU)** would implement the project activities according to the approved annual work plans and budgets. Provisions are made for salaries for officers and staff, field allowances for central MOA, GP, and LARI staff who would participate in project management and implementation, vehicles and office equipment together with corresponding operation and maintenance costs. Provisions are also made for national and international technical assistance and studies, as well as training, workshops and study tours to build the capacities of staff involved in project management and implementation.

The PMU would be responsible for procurement of goods and services under the project. It will advertise the Expression of Interest for the pre-qualification of consultants, services providers and contractors and enter into agreement for implementation of the project interventions, in accordance with the procurement guidelines adopted for the project.

The arrangement for project coordination and management is driven by: (i) the use of existing institutions and capabilities, as far as possible, whilst making necessary adjustments for building their capacity where needed; (ii) the need to create effective coordination mechanisms and synergies between MOA, GP, LARI and the farming communities so that maximum benefits from the project interventions are realized; and (iii) the importance of having an effective project M&E and knowledge management system that provides the necessary information for managers and decision makers and to reach credible conclusions about the effectiveness and efficiency of the project

The PMU needs to achieve effective synergy between the project components by providing strong and effective multi-disciplinary teams to implement the project, including its participatory approach both at central and field level to work together and report to a single line of command.

Key PMU staff will be recruited to meet agreed qualifications and should be approved by IFAD. The PMU should include at least the following staff:

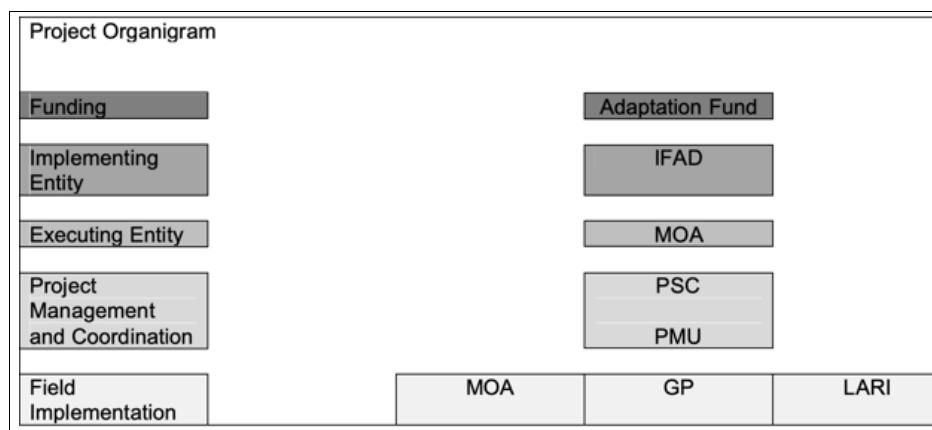
1. Project Manager who will report directly to MOA and the Project Steering Committee;
2. Senior Technical Expert hosted by GP who will be in charge of the implementation of Outcome 1;
3. Senior Technical Expert hosted by LARI who will be in charge of the implementation of Outcome 2;
4. M&E and Communication Specialist;
5. Administrative Assistant;
6. Other specialists as needed.

The PMU will be assisted by field multidisciplinary teams from MOA, GP, and LARI, supported by external consultants when needed, to implement the planned project activities.

IFAD will assume the role supervision and fund administration and will provide technical backstopping during project implementation.

Institutional support for improved coordination of the project activities would include provisions for: (i) Project Launch Workshop; (ii) workshops to familiarize implementing staff and beneficiaries with the objectives of the project, its components, implementation strategy, administrative and management procedures; (iii) Annual Review Workshops to assess the progress of component implementation as the basis for preparing the Annual Work Plan and Budgets (AWPBs) for the following fiscal year; and (iv) finalization of the Project Implementation Manual (PIM) to streamline participatory approaches and targeting, as well as, technical, administrative and financial management of the project.

Training. Provisions would be made on an ongoing and systematic basis for training the project and other staff from MOA, GP, and LARI on project cycle management (including participatory planning, monitoring and evaluation), implementation modalities, gender issues and financial management through workshops and seminars. Training would be provided for key and senior project staff in project management and administration, participatory project implementation methodologies and impact Monitoring and Evaluation.



Functions of management entities

Entity	Proposed Functions
National Steering Committee (NSC)	<ul style="list-style-type: none"> Overall oversight to ensure programme implementation Approves Annual Work plan (AWP) and Budget Approves strategy adjustment Appoints external evaluators Reviews project reports Integration of local lessons learnt into national policy context Knowledge management contribution Up-scaling of successful activities
Project Management Unit (PMU)	<ul style="list-style-type: none"> Reports to the PSC and IFAD Provide technical and administrative support Supervision of technical works Updating, readjustment of technical elements Coordination of implementation at local level Undertakes M&E activities Facilitates implementation Prepares AWP and Budget Prepares progress and financial reports Programme resource management Arranges meeting of the PSC Coordinates implementation partners
Ministry of Agriculture (MOA)	<ul style="list-style-type: none"> Overall oversight and coordination Implementation of Outcomes 3, 4 and 5 Contributes to M&E activities
Green Plan (GP)	<ul style="list-style-type: none"> Overall oversight and coordination Implementation of Outcome 1 Contributes to M&E activities
Lebanese Agriculture Research Institute (LARI)	<ul style="list-style-type: none"> Overall oversight and coordination Implementation of Outcome 2 Contributes to M&E activities

B. Describe the measures for financial and project risk management.

The Lebanese political and institutional circumstance has improved since last year while the country sustained its improvement and resilience to internal and external crises through sound macroeconomic and monetary performance. The GoL showed strong interest and commitment for this project as a concrete national pilot programme for adaptation to climate change. There are however political, institutional and technical risks associated with the implementation of the project. These risks have been taken into account in the project design, with a view to minimizing or mitigating them. Such risks and mitigation strategies are briefly summarised below. Based on the overall assessment, AgriCal can be classified as belonging to “moderate” risk category.

During the project formulation phase, key risks underlying the project have been analyzed and qualitatively assessed in connection with the context of the planned outcomes and target sites for the project. It is assumed that both IFAD as the Implementing Entity, and the Ministry of Agriculture, as the Executing Entity are responsible towards addressing and mitigating the project risks, although IFAD has the ultimate responsibility with regard to all financial risks, and the right of cessation of activities, or withdrawal of funding in the event of risks that cannot be

otherwise managed. Potential risks with an assessment of the degree of each risk, and the mitigation measures identified to mitigate are presented in the table below:

Risks and mitigation measures

No	Risk	Classification	Possible Measures for Addressing the Risk
1	Low human and institutional capacity for the implementation of CC related interventions, especially at the local level.	Moderate	The project has a strong capacity building and training component, designed to promote effectiveness and sustainability at the local level.
2	Delays in programme implementation, and particularly in the development of infrastructure intervention	Moderate	PMU to carry out feasibility studies for a number of the proposed infrastructure components, and identify any possible bottlenecks in implementation and undertake necessary measures to enhance implementation.
3	Unforeseen delays in undertaking essential preparatory works and surveys due to weather/access issues etc.	Moderate	Surveys to be scheduled to maximize favorable weather conditions. Early reconnaissance visits to remote areas will determine potential access difficulties.
4	Lack of incentives for particular local communities to cooperate in activities that do not yield immediate financial value, but aim at longer-term resilience, may reduce stakeholder engagement and comprehensive participation.	High	The project incorporates activities that yield immediate benefits for communities in terms of awareness, preparedness, skill development and income generation. This will be emphasized during all meetings and consultations with community representatives during the inception phase.
5	Delays in recruitment or appointment of qualified project staff may affect the timeframe	Low	A pro-active coordination mechanism will be established by IFAD and MOA during the project
6	Potential for unsatisfactory performance of government agencies in charge of implementing the project	Moderate	The competencies, authority and funding of the implementing agencies were assessed and the necessary support was prescribed. The provision of appropriate external technical support would limit the risk of possible insufficient technical performances.

Over the course of the project, a PMU risk log will be regularly updated in intervals of no less than every six months in which critical risks to the project have been identified. Issues/Risks will be raised to the NSC and adequate mitigation measures will be discussed/approved by NSC and Implemented. At the time of project formulation, strong political commitment from national as well as local partners is evident which will limit a number of risks from materializing. Consistent involvement of a diverse set of partners will further reduce these risks.

C. Describe the monitoring and evaluation arrangements and provide a budgeted M&E plan.

The project would introduce a monitoring, evaluation and knowledge management system to facilitate compilation and dissemination of relevant project knowledge about issues, experiences and insights to all stakeholders. The project would introduce a gender disaggregated system of data collection and reporting for each project component. The system would be designed to capture the rate of implementation against planned targets and objectives, as set out by the project design and reflected in the AWPBs, and would monitor: (i) the financial information of the proposed project; (ii) the regular and systematic recording and reporting of progress against planned project targets; and (iii) more importantly, the assessment of the impact of project activities on the target group and the environment.

The Monitoring and Evaluation of the project achievements and knowledge management would be the responsibility of PMU. The results-based approach will be adopted, involving regular recording of, and accounting for progress against AWPB targets; and routine, periodic assessments of movement towards beneficiary impact. In accordance with lessons learnt from previous projects, a strong and clearly defined M&E function will be established from the beginning of the project. For this purpose, the PMU staff will include a dedicated M&E officer.

The M&E and Knowledge Management Officer will be responsible for all M&E activities, based on the IFAD Guide, which specifies a matrix and performance checklist to orient the selection of indicators, baseline data, methods for data collection, synthesis and a communication strategy for lessons learned. Service providers, contractors and beneficiary groups will be the prime sources of data emanating from grass roots activities. The Project draft M&E matrix will be prepared in a participatory manner as part of the start-up activities in line with the logical framework.

Project monitoring and evaluation (M&E) is in-line with established IFAD procedures and will be carried out by the PMU, verified by MOA, GP, LARI, and IFAD. Dedicated support by the technical team at IFAD will be provided on a regular basis. The Results Framework of the project defines performance indicators for project implementation as well as the respective means of verification. A Monitoring and Evaluation system for the project will be established accordingly and implemented by the PMU.

The key M&E activities will rely on the update and validation of benchmark data used in project design; baseline surveys in the project selected sites; half-yearly data collection and reporting of activity and output targets and achievements; annual impact assessment and evaluation; a mid-term review; and a final completion assessment. The activities will be guided by a number of fundamental considerations:

- a) Data will be disaggregated by poverty, livelihood group and gender.
- b) Each implementing or partner agency will have clear M&E responsibilities with specific reporting deadlines and a forum for presenting and discussing the findings of the monitoring exercise.
- c) M&E will be linked to the project rationale, log frame, annual work plans and budgets and the beneficiary assessments. The findings of the M&E will be used to take corrective or enhancing measures at the level of project management.

The project key M&E activities include the following:

Project Inception Workshop

A Project Inception Workshop will be conducted within two months of project start up with the full project team, relevant government counterparts and IFAD. The Inception Workshop is crucial to building ownership for the project results and to plan the first year annual work plan. A fundamental objective of the Inception Workshop will be to present the modalities of project implementation and execution, and assist the project team to understand and take ownership of the project's goals and objectives. An Inception Workshop Report will be prepared and shared with participants.

Reporting

Semi-annual and Annual Project Reports will be prepared by the PMU and verified by the PSC to monitor progress made since project start and in particular for the previous reporting period. These reports include, but are not limited to, reporting on the following:

- Progress made toward project objective and project outcomes - each with indicators, baseline data and end-of-project targets (cumulative);
- Project outputs delivered per project outcome (annual);
- Lessons learned/good practices;
- Annual expenditure reports;
- Reporting on project risk management.

Quarterly Progress Reports will also be prepared by MOA, GP and LARI and submitted to the Project Manager to ensure continuous monitoring of project activities and identify challenges to corrective measures in due time.

A PMU risk log will be regularly updated in intervals of no less than every six months in which critical risks to the project have been identified.

Financial Reporting

In terms of financial monitoring, the project team will provide IFAD with certified periodic financial statements, and with an annual audit of the financial statements relating to the status of funds according to the established procedures.

External Evaluations

The project will undergo an independent external Mid-Term Evaluation at the mid-point of project implementation, which will determine progress being made toward the achievement of outcomes and identify course correction if needed. It will focus on the effectiveness, efficiency and timeliness of project implementation; will highlight issues requiring decisions and actions; and will present initial lessons learned about project design, implementation and management. Findings of this review will be incorporated as recommendations for enhanced implementation during the final half of the projects term. Final External Evaluation will be conducted 3 months before project closure.

The external evaluations would be carried out jointly by MOA and IFAD based on terms of reference prepared by the Government, and approved by IFAD. At the conclusion of the project a completion evaluation would be conducted, as an input into the Project Completion Report (PCR) through a formal survey preferably undertaken by a neutral agency with no previous involvement in project implementation.

Field Visits

Government authorities, members of PSC and IFAD staff will conduct regular field visits to project sites based on the agreed schedule in the project's Inception Report/Annual Work Plan to assess first hand project progress.

The M&E framework, including data collection and analysis arrangements, baseline information, and programme of work and budget will be updated at project start-up with the participation of the M&E officer as well as other concerned staff of the PMU, MOA, GP and LARI. The updated framework will be submitted to IFAD for approval not later than three months after project effectiveness.

The project budgeted Monitoring & Evaluation plan is presented in the table below:

M&E Activity	Responsibility	Budget (USD)	Timeframe
Inception workshop	PMU - MoA	2500	Within first two months of start date

Quarterly Reports	PMU	-	Every 3 Months
Semi-annual reports	PMU	-	Every 6 Months
Annual reports	PMU	-	Every Year
Mid-term Evaluation	PMU External Evaluator	22000 30,000	End of 2022 Year of implementation
Final Evaluation	PMU External Evaluator	30,000	Within last two months of the project
Final completion report	PMU	-	By the end date of the project
Field visits	PMU, PSC, IFAD	2000	Quarterly and upon need or request
Audit	IFAD	4000	After operational closure of the project
Total Indicative Cost		68,500	

D. Include a results framework for the project proposal, including milestones, targets and indicators.

Output	Indicator	Baseline	Target	Source of Verification	Risks and Assumptions
Component 1: Water Management					
Outcome 1: Increased water availability and efficient use through water harvesting and irrigation technologies	Number of beneficiaries	No supplementary water available from water harvesting in the project focus areas	700 beneficiaries + 50 indirect beneficiaries	Mid-term and final evaluations Project progress reports	Political instability might cause effectiveness or implementation delay. Delays in programme implementation, and particularly in the development of infrastructure intervention. Farmers cooperate with the project and provide the land and required contributions.
	Number of km of hill lake primary irrigation networks constricted		12 hill lakes 32.9 km of primary irrigation networks		
	Number of hectares served by efficient irrigation systems		262.5 Hectares		
	Quantity (m ³) of supplementary water available for agriculture as a result of water harvesting and the use of efficient irrigation systems		By end of project, at least 479,800m ³ of supplementary water available for agriculture in the project focus areas		

Output 1.1: Rainwater harvested from greenhouse roof tops	Number of Beneficiaries		2 beneficiaries + 50 indirect beneficiaries	Green Plan field reports Procurement reports	
	Number of greenhouse demonstrations	Zero hectares out of 1000ha approx.	2 Demos/0.5 Hectares		
	Quantity of stored water for supplementary irrigation	Zero m ³	800 m ³		

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Output1.2 Improved access to climate- resilient water & Water efficient irrigation systems deployed	Number of Beneficiari es	15,000ha all over the country. Data in focus area not available.	698 beneficiaries	Green Plan field reports Procurement reports	
	Number of km of hill lake primary irrigation networks constricted		12 hill lakes 32.9 km of primary irrigation networks		
	Number of hectares served by efficient irrigation systems		262 Hectares	Green Plan field reports Procurement reports	
	Quantity of water supplied to farms		479,000 m ³		

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Component 2: Adaptation Techniques Roll-out					
Outcome 2: Increased adaptation to climate change for crop production or income	Number of beneficiaries Change in food security in the programme area as a result of using climate-resilient agricultural and livestock production methods, measured as increase in quantity of local production		60,235 beneficiaries By year 4, 25% increase in crop and livestock production or in income in the focus areas compared to individual baselines	Mid-term and final evaluations Project progress reports Livelihood surveys Agriculture observatory annual production survey	Low human and institutional capacity for the implementation of climate change related interventions, especially at the local level. Project capable of mobilizing partners to contribute to the financial sustainability of the warning system.
Output 2.1: Enhanced early warning system to farmers through improved existing system	Number of meteorological stations installed in the project focus areas Number of staff trained on	60 weather stations 4 staff	132 additional weather stations 15 staff	LARI weather reports Training reports and	Farmers perceive the benefits of acting to the early warning system recommendations, and expand its use.

	<p>meteorological observation and analysis</p> <p>Frequency of production of improved climate risk information (for pest outbreak prediction, water demand, etc)</p>	Not available	Daily	<p>evaluations</p> <p>LARI weather reports Farmers' satisfaction survey</p>	
Output 2.2: Expanded farmer outreach and ensured financial and management sustainability of the warning system	<p>Number of farmers receiving climate risk information</p> <p>Financial flow to sustain the system</p>	<p>49000 farmer</p> <p>Zero %</p>	<p>60000 farmer</p> <p>50% of the system's cost covered by non-core budget</p>	<p>LARI weather reports Farmers' satisfaction survey</p> <p>LARI financial reports</p>	
Output 2.3: Capacity building on adaptation techniques for vulnerable field crops enhanced	<p>Number of project beneficiaries trained on agricultural adaptation measures disaggregated according to gender</p>	None	At least 200 farmers (30% women)	<p>Training reports and evaluations</p> <p>Training reports and</p>	

	Number of professionals trained to enable rolling out of climate-resilient agricultural production technologies and methods	None	20 professionals	Evaluations	
Output 2.4: Guidelines and recommendations on agricultural adaptation techniques for vulnerable areas developed	Agricultural adaptation techniques for vulnerable areas identified	None	5000 copies of the guidelines (on different techniques) published and disseminated on websites and networks	Published guidelines Project website	
Output 2.5: National fodder resource (NFRA) assessment prepared	List of fodder species, their distribution and nutritional value prepared The carrying capacity of the rangelands in the sampled areas calculated	Non existent	Nationwide assessment completed	Published NFRA study	

Component 3: Rangeland Management					
Outcome	Increased		At least 25%	Mid-term	Lack of incentives
3: Increased resilience of shepherds and small ruminants to climate change through sustainable rangeland management	<p>productivity of the rangelands in the focus areas measured by increase in income of locally produced meat and quality of dairy products</p> <p>Number of beneficiaries</p>		<p>increase in income and milk productivity by end of the project</p> <p>12,4220 beneficiaries + 35,450 indirect</p>	<p>and final evaluations Project progress reports Milk production monitoring MoA</p>	<p>for particular local communities to cooperate in activities that do not yield immediate financial value, but aim at longer-term resilience, may reduce stakeholder engagement and comprehensive participation</p>
Output 3.1: Pilot sustainable rangeland management plan implemented	Management plan prepared and adopted	Non existent	Two management plans	Published management plan	
	National guidelines prepared and adopted	Old obsolete guidelines not based on scientific results	Adopted national guidelines	Published national guidelines MOA Decisions	
	<p>Number of professionals trained on sustainable rangeland management</p> <p>Number of households trained and participating in</p>	<p>None</p> <p>None</p>	<p>20 professionals</p> <p>200 households (30% Women) +</p>	<p>Training reports and evaluations</p> <p>Field surveys</p>	

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	rangeland management and dairy product processing disaggregated according to gender				
	Number of households benefiting from flood risk reduction Number of nurseries rehabilitated Number of seedlings produced Area covered by flood risk reduction measures	One in the focus areas Zero 2 watersheds managed out of 14	12,200 households + 35,450 indirect beneficiaries nurseries nursery 500,000 seedling/year 2300 hectares (2 additional watersheds)	Field survey MOA reports	

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Component 4: Policy and Knowledge Management					
Outcome 4: Policy influenced and lessons learned and shared through a knowledge management system	Level of increase in awareness about climate change among decision makers and farmers	Not existent	At least 60% of targeted decision makers and farmers show increase in the level of awareness	Mid-term and final evaluations Project progress reports	Changes in the government structures and functions of the implementing partners

Output 4.1: Policy advocacy activities implemented	Number of policies/plans/strategies revised or developed as a result of policy advocacy activities	None	By end of project, at least 3 policies/plans/strategies	Published policies/plans/strategies Governmental decisions and decrees	Decision and policy-makers at all levels are slow to appreciate the need to mainstream climate change considerations into activities and investments
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Output 4.2: Knowledge management system established and knowledge management activities implemented	Number of knowledge products developed for use in policy advocacy activities	None	By end of project, at least 4 policy briefs	Policy Briefs	
	Number of lessons learned and best practices up		Every year of project implementation	Experience Notes	
	taken in the project outreach strategy		n, at least 8 lessons learned and best practices consolidated in Experience		
	Number of relevant networks or communities through which lessons learned are disseminated		Notes disseminated through website and other media Project outputs disseminated through at least two networks	Project website Project inputs to networks	

Adaptation Fund Core Impact Indicator "Number of Beneficiaries"				
<u>Date of Report</u>	<u>18-Feb-22</u>			
<u>Project Title</u>	<u>Climate Smart Agriculture: Enhancing Adaptive Capacity of the Rural Communities in Lebanon (AgriCAL)</u>			
<u>Country</u>	<u>Lebanon</u>			
<u>Implementing Agency</u>	<u>International Fund for Agricultural Development (IFAD)</u>			
<u>Project Duration</u>	<u>5 years</u>			
	<u>Baseline (absolute number)</u>	<u>Target at project approval (absolute number)</u>	<u>Adjusted target first year of implementation (absolute number)</u>	<u>Actual at completion (absolute number)</u>
-				
<u>Direct beneficiaries supported by the project</u>	<u>4 500</u>	<u>20 810</u>	<u>73 355</u>	-
<u>Female direct beneficiaries</u>	<u>n.a</u>	<u>n.a</u>	<u>22 007</u>	-
<u>Youth direct beneficiaries</u>	<u>n.a</u>	<u>n.a</u>	<u>22 007</u>	-
<u>Indirect beneficiaries supported by the project</u>	<u>n.a</u>	<u>n.a</u>	<u>35 500</u>	-
<u>Female indirect beneficiaries</u>	<u>n.a</u>	<u>n.a</u>	<u>n.a</u>	-
<u>Youth indirect beneficiaries</u>	<u>n.a</u>	<u>n.a</u>	<u>n.a</u>	-

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<u>Adaptation Fund Core Impact Indicator “Assets Produced, Developed, Improved, or Strengthened”</u>				
<u>Date of Report</u>	<u>18-Feb-22</u>			
<u>Project Title</u>	<u>Climate Smart Agriculture: Enhancing Adaptive Capacity of the Rural Communities in Lebanon (AgriCAL)</u>			
<u>Country</u>	<u>Lebanon</u>			
<u>Implementing Agency</u>	<u>International Fund for Agricultural Development (IFAD)</u>			
<u>Project Duration</u>	<u>5 years</u>			
	<u>Baseline</u>	<u>Target at project approval</u>	<u>Adjusted target first year of implementation</u>	<u>Actual at completion</u>
-				
<u>Sector</u> <u>Provision of expanded and improved food security systems</u>	-	-	-	-
<u>Targeted Asset</u> <u>Watersheds produced</u>	<u>2 watersheds managed out of 14</u>	<u>2 watersheds</u>	<u>2 watersheds</u>	-

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Alignment of Project Objectives/Outcomes with Adaptation Fund Results Framework

Project Objective(s)	Project Objective Indicator(s)	Fund Outcome	Fund Outcome Indicator
To support the implementation of climate change adaptation measures in the agriculture sector in three highly vulnerable focus areas.	<u># of poor smallholder households whose livelihoods from agriculture has been increased because of AgriCAL, disaggregated by sex</u>	<p>Outcome 4: Increased adaptive capacity within relevant development and natural resource sectors</p> <p>Outcome 5: Increased ecosystem resilience in response to climate change and variability-induced stress</p> <p>Outcome 7: Improved policies and regulations that promote and enforce resilience measures</p>	<p>4.1. Development sectors' services responsive to evolving needs from changing and variable climate</p> <p>5. Ecosystem services and natural assets maintained or improved under climate change and variability-induced stress</p> <p>7. Climate change priorities are integrated into national development strategy</p>
Project Outcome(s)	Project Outcome Indicator(s)	Fund Output	Fund Output Indicator
1. Increased water availability and efficient use through water harvesting technologies	Quantity (m3) of supplementary water available for agriculture	Output 4: Vulnerable physical, natural, and social assets strengthened in response to climate change impacts, including variability	4.1.2. No. of physical assets strengthened or constructed to withstand conditions resulting from climate variability and change (by asset types)
2: Increased adaptation to climate change for crop production	Change in food security in the programme area as a result of using climate-resilient agricultural and livestock production methods, measured	Output 5: Vulnerable physical, natural, and social assets strengthened in response to climate change impacts, including variability	5.1. No. and type of natural resource assets created, maintained or improved to withstand conditions resulting from climate variability and change (by type of assets)
3: Increased resilience of shepherds and small ruminants to climate change through sustainable rangeland	Increased productivity of the rangelands in the focus areas measured by increase in quantity of locally produced meat and dairy	Output 5: Vulnerable physical, natural, and social assets strengthened in response to climate change impacts, including variability	5.1. No. and type of natural resource assets created, maintained or improved to withstand conditions resulting from climate variability and change (by type of assets)
4. Policy influenced and lessons learned and shared through a knowledge management system	Amount of compensation funds disbursed to affected farmers Level of increase in awareness about climate change among decision makers and farmers	Output 7: Improved integration of climate-resilience strategies into country development plans	7.1. No., type, and sector of policies introduced or adjusted to address climate change risks

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

A. RECORD OF ENDORSEMENT ON BEHALF OF THE GOVERNMENT³

Provide the name and position of the government official and indicate date of endorsement. If this is a regional project/programme, list the endorsing officials all the participating countries. The endorsement letter(s) should be attached as an annex to the project/programme proposal. Please attach the endorsement letter(s) with this template; add as many participating governments if a regional project/programme:

Nasser Yassin Minister of Environment	Date: 13/12/2021
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B. IMPLEMENTING ENTITY CERTIFICATION

Provide the name and signature of the Implementing Entity Coordinator and the date of signature. Provide also the project/programme contact person's name, telephone number and email address

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, understands that the Implementing Entity will be fully (legally and financially) responsible for the implementation of this project/programme.	
Tom Mwangi Anyonge Implementing Entity Coordinator <i>Director, OiC, Environment, Climate, Gender and Social Inclusion Division (ECG), IFAD</i>	
Date: 10/01/2022	Tel. and email: +39 06 5459 2519 t.anyonge@ifad.org
Project Contact Person: Nicolas Tremblay <i>Lead Regional Environment and Climate Specialist – Near East, North Africa, Europe and Central Asia, IFAD</i> +20 2 2549 3873; n.tremblay@ifad.org IFAD HQ focal point: Janie Rioux <i>Senior Technical Specialist (Climate Change), ECG Division, IFAD</i> Email: j.rioux@ifad.org	

ANNEX 1 National Consultation

- A. Invitation**
- B. Agenda**
- C. Proceedings Brief**
- D. List of Participants**

A. Invitation

B. Agenda



Consultation Meeting on the Project Proposal
 "Climate Smart Agriculture: Enhancing Adaptive Capacity of the Rural Communities in Lebanon (AgriCAL)"

Tentative Agenda

Wednesday February 8, 2012

Time	Activity	Presented/Facilitated by
09.00-09.15	Registration	
09.15-09.45	Welcoming note and opening remarks Priorities of MoA in Lebanon and Needs for enhancing the resilience of the Agricultural Sector Lebanon Second National Communication to the UNFCCC	Ministry of Agriculture Ministry of Environment IFAD
09.45-10.00	IFAD in Lebanon: HASAD Project	Green Plan / IFAD
10.00-10.15	Agriculture and Climate Change in Lebanon: Ongoing Activities	Lebanese Agricultural Research Institute (LARI)
10.15-10.45	Presentation of the AgriCAL Proposal	Ministry of Agriculture/IFAD
10.45-11.00	Coffee break	
11.00-13.00	Discussion <ul style="list-style-type: none"> - Synergies/duplication with on-going and planned activities - Suitability/cost-effectiveness of proposed adaptation techniques (Water harvesting – greenhouses, agricultural roads) - Activities needed to reduce vulnerability in the rangelands, any perverse incentives - Participatory approaches for vulnerability assessment: sharing experiences - How can implemented activities be up-scaled - Any experience in quantifying economic and social benefits of rangeland management 	IFAD

C. Main Proceedings



Consultation Meeting on the Project Proposal
“Climate Smart Agriculture: Enhancing Adaptive Capacity of the Rural Communities in Lebanon (AgriCAL)”

PROCEEDINGS BRIEF

Wednesday February 8, 2012

Introductory Presentations:

IFAD/Rami Abu Salman: Brief presentation about the Adaptation fund emphasizing that the fund focuses on concrete adaptation actions and broad consultation to ensure that the project responds to national priorities – the purpose of the consultation.

MoA/Chadi Mhanna: the proposed project is in line with the MOA strategy for 2010-2020, especially with respect to natural resources management. The MOA is launching its first National Forest Policy (NFP) considering the impacts from climate change.

Green Plan/Raymond Khoury: HASAD briefing; target group of 24000 poor households, 890,000m³ of water storage; increase yields by 30%.

LARI/Michel Frem: LARI enhanced its early warning system with 900 sms reaching farmers. It has 60 weather stations, 12 monitoring stations, 120 laboratories, staff of 430 technicians, and able to produce all the needs of Lebanon from wheat seeds (6000t) from varieties adapted to CC. it is working on IPM namely on Wheat rust and Tuta Absoluta on tomato, which outbreak results from CC.

Discussion Session:

Green Plan: upgrade the outcome 1 for water harvesting from agriculture roads to all roads, and to do the activities all over the country.

IFAD (Aziz Merzouk): increase budget for storage facilities, namely for water harvested from roads. Cost effectiveness on these issues is mentioned in HASAD document.

CDR (Faten A.): ADELNORD is implementing 120km of roads and 2 hill lakes; ready to implement one common pilot road with the project. Requested that Agrical ensures the deployment of irrigation systems from the water harvested in the 2 hill lakes, as ADELNORD will ensure the water to farm gate only.

CNRS (Talal D.): focus on water distribution after harvesting from roads. Presented CNRS experience in agro-pastoral system, project with IFAD on monitoring water and yield for potato and wheat.

GIZ (Kassem J.): recommended the use of a layer of stone over the plastic membrane in hill lakes to increase shelf life. Recommended empowering MOA extension centres rather than creating FSCs.

UNDP (Lea K.): Confirmed that technologies proposed in AgriCal are in line with Technology Needs Assessment (TNA) conducted for the water and agriculture sectors in Lebanon. Agrical provides an opportunity to immediately build on policy recommendations of the government.

LARI (Frem): suggested spending one day with partners and stakeholders to discuss activities and build on synergies.

MOA (Zeina T.): avoid trend of protection and conservation and focus on food security and management. Proposing the replacement of the existing green houses with single span green houses to ensure continued yield in the light of climate change impacts in Lebanon. Discussion around this point affected changes in outcome 1.

MOA (Dahej): increase pilot area in rangeland component to Mount Lebanon and West Bekaa-Rachaya. Stressed on importance of assessment of rangeland, rehabilitation of rangeland, creation of hill lakes for animals to drink.

FAO (Dany L.): Noted importance to consider rangeland access issues. Information should also be gathered about shepherds' movement, assess the demand on fodder; raised PPP issue, especially that extension is not a "paying" service. Explained FAO's expertise in previous projects on Greenhouses, and suggested that MOA Plant resources directorate should be involved in project.

ICARDA (Hassan M.): ICARDA is developing technologies to adapt to CC. This includes Conservation agriculture, plant breeding, spineless cacti as animal fodder, deficit irrigation. Noted that capacity building for farmers on how to use these technologies is essential. Need to link with other projects including what has been done like Machrek-Maghreb project on rangeland management with AUB. Suggested to work on drainage to solve water logging problem.

ITALIAN COOP: ready to share outcomes of projects realized in similar field, mainly on water efficient use.

MOA (Chady M.): on-going project with GIZ-SYLVAMEDITERRANEA on NFP; focuses on forest policy, but includes also rangeland, need to avoid duplication. Not to forget trans-boundary herds movement in project.

UNDP/MoE (Lea K): MOE/climate change unit is ready to host the next meeting as proposed by Mr.Frem to exchange projects experiences and undertake further consultation on AgriCAL after the project activities are modified to respond to the national consultation and field consultation.

CDR (Nancy): willing to provide data or collaborate in several activities. Highlighted the study on land management or master plan for natural resources use in Danniyeh, and the regional master plan for Akkar heights with ADELNORD. Pointed olive hydric stress in Akkar (Beino).

GIZ-EFL (Charbel Z.): will to share projects details elaborated by EFL.

CDR (Faten A.): creation of water user associations require close coordination with MOEW; deficit irrigation on olive and Conservation agriculture direct seeding for forage crops could be applied in Agrical.

IFAD (Aziz) and FAO (Dany): rangeland fodder resources assessment would require more than 3 years to be realized and lots of resources mobilized. The focus should be on the main HASAD areas

Ricardo: proposed a table to be filled by all partners including their list of projects to be used as a tool to gather information about on-going and planned projects.

MOA (Mohamad K.): 8 axes in MOA strategy. AGRICAL is a result of convergence of MOA and IFAD's policies. Solidarity funds first pilot activity to be launched for table grape production. Priority to work on rangeland. Welcomed a meeting among partners as an initiative for coordination.

Additional general comments:

- Project implementation to be reduced to 42 months
- Second national consultation workshop to be sponsored by the Government and held prior to the final submission of the project

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2021 Consultative Process

As part of the formulation of the proposed project changes, consultations have been conducted with key stakeholders including representatives from the government and UN agencies and beneficiary communities. Details such as completed consultation questionnaires and attendance sheets are available on request. Consultations that shaped this proposal include consultations to (i) align with other stakeholder, (ii) identify the specific needs and specific concerns of vulnerable groups and (iii) identify potential environmental and social impacts according to the 15 principles of AF's ESP and its GP.

Consultations were conducted with the relevant ministries and national institutions to reconfirm project alignment with national priorities (i.e. national strategies and plans). Due to the dynamic situation in Lebanon, IFAD conducted another round of consultation with UN agencies and international organizations as they are increasingly stepping in order to accommodate for the ongoing crisis. The table below shows the details of the purposes of these consultations.


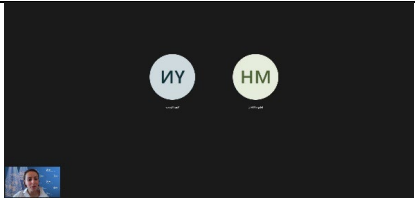
Organization/ Group	Principle purpose				Method used
	Align with stakeholders	Ensure relevance of AgriCAL activities	Identify needs of vulnerable groups	Identify potential soc. and env. impacts	
FAO	X	X			Written questionnaire
UNEP	X	X			Written questionnaire
UNOPS	X	X			Written questionnaire
UNICEF	X	X			Written questionnaire
University of Balamand	X	X			Written questionnaire
Lebanese University- Life and Earth Sciences	X	X			Written questionnaire
Prime Minister Office for Strengthening DRM Capacities in Lebanon	X	X			Written questionnaire
Ministry of Agriculture	X	X			In-person meeting and

					written questionnaire
Ministry of Environment	X	X		X	Zoom meeting
Lebanese Agricultural Research Institute (LARI)	X	X			In-person meeting and written questionnaire
Lebanon Reforestation Initiatives (LRI)	X	X			Written questionnaire
IUCN	X			X	Zoom meeting and written questionnaire
Municipalities	X				Focus groups
Participatory approach consultant			X	X	Zoom
UN Women	X		X	X	Zoom
Vulnerable groups	X		X		Focus groups
WFP	X		X		Written questionnaire

The results of the above consultations confirmed the project's relevance to the current climate change risks and its alignment with national policies including Lebanon's NDC. The potential risks were well noted and the ESMP was updated accordingly.




In Q4 of 2021, consultations were conducted with project beneficiary groups including vulnerable groups through focus group discussions. The consultations aimed to identify the most hazardous climate change impacts on target communities and groups, their barriers to adapt to such impacts, the relevance of the current ongoing activities and their potential concerns regarding proposed project changes. Vulnerable groups are mainly the poorest beneficiaries including women, youth and people with disabilities. These consultations were organized as part of an ongoing supervision moment of AgriCAL. When COVID-19 related restrictions did not allow for in country consultations, the project teams conducted the consultations on behalf of the mission.

The table below shows the results of consultations with specific entities and communities as part of AgriCAL's compliance to AF's ESP and GP.

Stakeholder	Consultation objective	Outcome	Incorporation into AgriCal	Evidence
IUCN	The aim of this meeting is to ensure the project is doing no harm in alignment with principles 9 and 10 of AF's ESP regarding natural habitats and biological diversity.	No risk for the proposed changes on areas of natural habitats and biological diversity.	Included in the ESP risk screening and analysis annex.	
UN Women	The aim of this conversation was to better align with stakeholder priorities and identify the needs of vulnerable populations in specific women.	<p>-PSDP programme three year programme funded by multiple donors and implemented by UNWOMEN and UNIDO.</p> <p>-The project has 3 components. Macro or legislative component - developing policies and legislations in the agricultural sector to promote women's rights. Meso component - UNIDO is supporting women start-ups. Micro level - working on soft-skills and allowing them to start businesses in the agricultural sector.</p> <p>-Impact of Lebanese breakdown is quite high –</p>	<p>-UNWOMEN suggested collaboration and knowledge sharing as part of component 1 for the PSDP project.</p> <p>-UNWOMEN will share their gender analysis of the agricultural sector to be finished in January 2022.</p> <p>-Suggest to ensure a threshold for women in rural institutions.</p> <p>-Suggest to directly empower women</p>	

		<p>more job loses for women than for men. Women during COVID exiting the labour force. Now it is potentially more. Protection risks, and food poverty is increasing.</p> <p>-Digital divide between men and women exist. Get women in job training opportunities. ICT sector in Lebanon has a potential to grow – women can become more engage in this sector. Successful intervention of 110 women. Percentage of women working in the ICT sector</p>	through economic activities.	
AgriCAL's participatory approach consultant - Ms. Maya Saade	<p>The aim of this conversation was to better understand the needs of vulnerable populations and identify potential social impacts in areas where component 3 activities are taking place.</p>	<p>-Shepherds are very vulnerable populations – the majority of Sheperds are men however some female shepherds are present.</p> <p>-Different views exist on what on what pastoralism is and more importantly who are the main stakeholders involved in pastoralism.</p>	<p>-Ensure that a wide range of stakeholders are involved in the implementation.</p> <p>-Ensure that village level participation is ensured during the implementation.</p>	

		<ul style="list-style-type: none">- Easy to join the shepherd community – there is an increase of youth due to the crisis and the pastoral system in Lebanon is aging. The pastoral community remains closed in the sense that certain unspoken rules exist.-Improved pastoral management will decrease trespassing		
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<p>Vulnerable groups at Ehmej, Barqua, Al Zrazir, Ras Baalbeck and Kaa.</p>	<p>The aim of these focus group discussions is:</p> <ol style="list-style-type: none"> 1) Identify any risks related to the proposed changes to AgriCAL 2) Identify mitigation measures to any potential risks 3) Assess the relevance of the ongoing activities to vulnerable groups needs 	<p>1- Ras Baalbeck and Kaa: All the communities consulted (men and women) agreed that AgriCAL's approach to reduce flood risk will be very efficient and will help them adapt to flash floods. Most of the respondents agreed that the only risks would be in potential lack of supervision on construction works or lack of maintenance on the longer term.</p> <p>2- Ehmej, Barqua and Al Zrazir hill lakes: The main questions were around how beneficial the irrigation networks are, if there are any risks foreseen and the management arrangements. The majority agreed that these networks will help them with their agricultural activities especially in a declining water availability context. In the three hill lakes, beneficiaries have already been in touch with the respective municipalities with regards to the management, operation and maintenance arrangements of these</p>	<p>The findings helped with the formulation of the proposed changes to AgriCAL to meet the needs of the communities. Consultations also fed into the assessment of potential risks related to the 15 principles of AF's ESP including gender specific risks. Based on identified risks, the discussions helped the team update the ESMP.</p>	  
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		networks so as not to create conflict between beneficiaries.		
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Annex 2: ESI Assessment and ESMP

I. Screening and Categorisation

A. ESI Screening and categorisation

AgriCAL's main objective is to increase community resilience and adaptive capacity to climate change in Lebanon. The objective is to support the implementation of climate change adaptation measures in the agriculture sector in three highly vulnerable focus areas. However, there are risks that are associated with the project activities especially as changes occurred to some activities mainly due to the prolonged execution duration. To ensure compliance with the AF ESP, all project activities (including the ones involving changes) have been screened against the 15 AF principles to identify potential environmental and social risks and to assess related potential impacts. Where risks have been identified, measures to mitigate risks have been integrated into the ESMP with the appropriate monitoring mechanisms. Data and analysis were provided based on collected disaggregated data focused on identification of climate change related needs, risks, constraints and requirements specific for marginalized and vulnerable groups especially of women and youth. Activity formulation and the identification and verification of potential risks and impacts have been done with project beneficiary groups through surveys and on-field meetings.

Checklist of environmental and social principles	No further assessment required for compliance	Potential impacts and risks – further assessment and management required for compliance
ESP 1 Compliance with the Law	x	No risk.
ESP 2 Access and Equity	x	<u>No risk-Low risk.</u> <u>There is some risk related to access to irrigation water from the hill lakes especially for farmers downstream. In addition to the networks established from the hill lakes, the project will invest in drip irrigation equipment to increase water-use efficiency which might create conflict for some farmers who are not selected for drip irrigation. To address this risk, community consultations took place with project beneficiaries for each project activity / output to identify possible rivals, disputants and concerns related to equal access of project benefits. The reallocations made to component 1 allows AgriCAL to provide equal access to all 698 beneficiaries for on-farm irrigation so as not to create any conflict within the community. The risk and the mitigation measure were incorporated into the ESMP.</u>
ESP 3 Marginalized and Vulnerable Groups	x	No risk.
ESP 4 Human Rights	x	No risk.
ESP 5 Gender Equity and Women's Empowerment	x	<u>No risk-Low risk.</u> <u>As noted in the gender analysis, gender imbalances persist in for example access to good quality education, political participation and social participation. The Lebanese economic downturn has and will likely further exacerbate gender inequalities in the country. To ensure that the project will have a positive impact on</u>

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Checklist of environmental and social principles	No further assessment required for compliance	Potential impacts and risks – further assessment and management required for compliance
		<u>the empowerment of women, the project includes gender sensitive planning and implementation methods as further detailed per component in the gender matrix. The ESMP also includes measures to ensure taking gender concerns into consideration.</u>
ESP 6 Core Labour Rights	x	No risk.
ESP 7 Indigenous Peoples	x	No risk.
ESP 8 Involuntary Resettlement	x	No risk.
ESP 9 Protection of Natural Habitats	x	No risk.
ESP 10 Conservation of Biological Diversity	x	No risk.
ESP 11 Climate Change	x	No risk.
ESP 12 Pollution Prevention and Resource Efficiency	x	No risk.
ESP13 Human Health		Low Risk. The COVID-19 global pandemic continues to threaten the health sector around the world. Project activities that involve community mobilization, meetings, workshops or stakeholder participation may pose a threat of widespread infections. The project will continue to monitor the situation as it has done in 2020 and 2021 taking all the safety precautions in alignment with WHO guidelines and all the national guidance on the matter. Where relevant and without undermining the project's objectives, the PMU will use online tools for meetings and consultations to the extent possible.
ESP 14 Physical and Cultural Heritage	x	No risk.
ESP 15 Lands and Soil Conservation	x	<u>No risk.</u> <u>Low risk.</u> <u>The project ensures that no negative impacts on lands and soil will result from project activities- including the proposed changes. No areas of fragile soils or valuable lands have been identified among the target areas. No major excavations will take place.</u> <u>On the other hand, the proposed interventions under component 3 may pose some risk on the land around the targeted watershed.</u>

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Checklist of environmental and social principles	No further assessment required for compliance	Potential impacts and risks – further assessment and management required for compliance
		<u>The Installation of hafeers, stone check dams, gabions and contour line walls may have a negative impact on land as a result of the construction works involved. This may impact the land's ability to provide its ecosystem services around watersheds. However, the project will ensure that all the construction works follow the Environmental Impact Assessment Process supervised by the Ministry of Environment as integrated in the ESMP. Consultations with communities in these areas concluded that flood risk management is an absolute priority to protect the rangelands and thus these interventions are required. The development of the rangeland management plans will ensure the sustainability of these interventions and the involvement of communities in decision-making.</u>

B. Alignment between AF ESP Guidance Principles and IFAD 2017 SECAP Guidance Statements

1. IFAD's Social, Environmental and Climate Assessment Procedures (SECAP) were approved by the Executive Board became effective in 2015 and were updated in 2017. These procedures defined an improved course of action for assessing social, environmental and climate risks to enhance the sustainability of results based country strategic opportunities programmes (RB-COSOPs), country strategy notes (CSNs), programmes and projects. SECAP along with the guidance statements (GS) sets out the mandatory requirements and other elements that must be integrated throughout the project life cycle. The 2017 updated version: (i) draws on lessons learned in SECAP's implementation from 2015 to the present; (ii) clarifies the mandatory and non-mandatory requirements applicable to IFAD-supported investments; (iii) further aligns IFAD's environmental and social standards and practices with those of other multilateral financial institutions; (iv) reflects IFAD's complementary policies²⁷ and climate mainstreaming agenda; (v) enables IFAD's continued access to international environment and climate financing; and (vi) better aligns IFAD's programming with the General Conditions for Agricultural Development Financing. All IFAD projects entering the pipeline are subject to an environmental, social and climate risk screening, and are assigned a risk category for environment and social standards (A, B, C), and for climate vulnerability (high, moderate, low). These findings, along with subsequent analysis and assessments, must be reflected in the project's SECAP review note. Projects with environment and social category "C" and climate risk "low" do not require any further analysis.
2. All category "B" projects must have a SECAP review note including a matrix of the environment and social management plan (ESMP) at design stage. The identified social and environmental risks, and opportunities-management measures must be reflected in the project design and the project design report (PDR). The ESMP matrix must be integrated into the project's implementation manual or developed as a stand-alone guidance document for the project management unit late in the design stage or early in implementation. All category "A" projects must have an ESIA at the design stage (or relevant stage of implementation). The draft and final ESIA reports, and other relevant documents²⁸ must be disclosed in a timely and accessible manner at the quality assurance stage (or other stages during project implementation).
3. For all projects with a "moderate" climate risk classification, a basic climate risk analysis must be conducted during the project design stage and included in the SECAP review note. Adaptation

²⁷ Including, but not restricted, to policies on targeting (2006), gender equality and women's empowerment (2012), indigenous peoples (2009). Available at: www.ifad.org/operations/policy/policydocs.htm.

²⁸ Including environment and social management frameworks (ESMFs), draft resettlement action plans and frameworks (RAFTs), draft mitigation plans and documentation of free, prior and informed consent (FPIC) and indigenous plan (IP) consultation processes.

and mitigation measures must be mainstreamed into the project design and PDR. For all projects with “high” climate risk classification, an in-depth climate risk analysis must be conducted during project design and adaptation and risk-mitigation measures must be mainstreamed into the project design.

4. IFAD 2017 SECAP includes 14 Guidance Statements (GS) with: (i) an introduction to each subject, (ii) how the subject has been addressed in IFAD projects, (iii) the environmental, climate change and social issues linked to the subject; (iv) Criteria for environmental screening and scoping of IFAD projects; (v) potential mitigation and adaptation plans and measures for controlling adverse impacts, (vi) the international legal context. The following table provides some information about the relation between AF ESP Principles and IFAD SECAP:

AF ESP Guidance Principles	IFAD SECAP GS, Guiding Values and Principles
ESP1 Compliance with the Law	<p>- SECAP requires that activities in the framework of the IFAD financed projects or programmes meet IFAD’s safeguard policy guidance, comply with applicable national laws and regulations (labour, health, safety, etc.) and international laws and treaties, and the prohibited investment activities list produced by the International Finance Corporation is adhered to.</p> <p>- Project design should review: (i) current national policies, legislation and legislative instruments governing environmental management health, gender and social welfare, climate change (mitigation and adaptation) and governance with their implementation structures, identify challenges, and recommend appropriate changes for effective implementation; (ii) all relevant international treaties and conventions on the environment, climate change, health, gender, labour and human rights to which the country is a signatory.</p>
Principle 2 Access and Equity	<p>Access and Equity is a cross-cutting issue in all the 14 SECAP Guidance Statements. SECAP requires that projects and programmes ensure the participation of target groups and equitable distribution of benefits. When projects result in physical or economic displacement (affecting access and user rights to land and other resources), the borrower or grant recipient should obtain FPIC from the affected people, document stakeholder engagement and consultation process and prepare resettlement plans or frameworks. The documents must be disclosed in a timely and accessible manner at the QA or relevant implementation stage.</p> <p>GS 7 - Water In the case of water-related projects like the water points, project design should: (i) consult all local water users, and involve beneficiaries in all stages of infrastructure development, from design, through operation and management, to rehabilitation and reconstruction; (ii) ensure equitable, reliable and sustained access to, and use and control of, water; (iii) address the gender dimensions in all stages.</p> <p>GS 11: Development of value chains, micro- and small enterprises (MSEs) From a social perspective, additional good practices for IFAD’s support to and promotion of value chain and MSE development might include among others: (vi) favourable working conditions within newly created green jobs throughout the value chain, including in local food systems; (vii) improving workplace safety and reducing community exposure to environmental hazards and public health risks; (viii) creation of specific employment and entrepreneurial opportunities for youth, for example in supply of information or support services to the value chain; (ix) harmonization with national and international labour standards; and (x) strengthened capacity for good practices, including employment opportunities for landless and other marginalized groups.</p> <p>Other IFAD policies that support and complement this principle are: Rural Enterprise Policy, Rural Finance Policy, Private Sector Strategy, Improving Access to Land Tenure Security Policy, Gender Equality and Women’s Empowerment Policy, Engagement with Indigenous Peoples Policy, Targeting Policy, Youth Policy Brief, Climate Change Strategy. Moreover,</p>

	<p>IFAD has been supporting the Principle for Responsible Agricultural Investment (PRAI), the African Land Policy Framework and Guidelines, including the Guiding Principles on Large Scale Land-based Investments, along with other frameworks and guidelines aimed at the social and economic empowerment of poor rural women and men and social and economic equity more generally.</p>
<p>ESP 3 Marginalised and Vulnerable Groups.</p>	<p>Marginalized and Vulnerable Groups is a cross-cutting issue in all the 14 SECAP Guidance Statements.^[1] A robust SECAP process requires attention to social dimensions such as land tenure, community health, safety, labour, vulnerable and disadvantaged groups, and historical factors, particularly in relation to natural resource management. It not only looks at compliance (e.g. managing potential negative impacts), but expected positive impacts and ways to maximize opportunities. To assure a good contribution to the quality of SECAP, project design should assess the socio-economic and cultural profile, including key issues relating to disadvantaged or vulnerable groups, conflict, migration, employment and livelihoods. Consultation with communities and stakeholders must be maintained throughout the project lifecycle, especially in high-risk projects. For investment projects with a projected high sensitivity to climate hazards, IFAD requires a climate vulnerability analysis which can help to improve the targeting of investment actions to include the most vulnerable and least resilient target groups.^[2]</p> <p>GS 13 – Physical and economic resettlement.^[3] Specific attention should be given to maximizing opportunities, avoiding involuntary resettlement, enhancing gender equality and women's empowerment and reducing vulnerability to risks/effects of climate change and variability and other project impacts. In any case, emphasis should also be on involving key stakeholders especially vulnerable groups and marginalized poor communities – including female-headed households, the elderly, or persons with physical and mental disabilities – in project design and implementation, and addressing public health concerns (e.g. HIV/AIDS). Should resettlement or economic displacement be envisaged, the FPIC and the do-not-harm principles – which are two pillars of IFAD's Improving Access to Land Tenure Security Policy – will be followed at all times and for all its beneficiaries for "any development intervention that might affect the land access and use rights of communities.</p> <p>GS 11: Development of value chains, micro- and small enterprises (MSEs). From a social perspective, additional good practices for IFAD's support to and promotion of value chain and MSE development might include among others: (vi) favourable working conditions within newly created green jobs throughout the value chain, including in local food systems; (vii) improving workplace safety and reducing community exposure to environmental hazards and public health risks; (viii) creation of specific employment and entrepreneurial opportunities for youth, for example in supply of information or support services to the value chain; (ix) harmonization with national and international labour standards; and (x) strengthened capacity for good practices, including employment opportunities for landless and other marginalized groups.^[4] Other IFAD policies that support and complement this principle are: Improving Access to Land Tenure Security Policy, Gender Equality and Women's Empowerment Policy, Engagement with Indigenous Peoples Policy, Targeting Policy, Youth Policy Brief, Climate Change Strategy, Rural Enterprise Policy, Rural Finance Policy, Private Sector Strategy.</p>
<p>ESP 4 Human Rights</p>	<p>Human Rights is a cross-cutting issue in all the 14 SECAP Guidance Statements.^[5] Among the Guiding Values and Principles for SECAP, there is the principle to "support borrowers in achieving good international practices by supporting the realization of United Nations principles expressed in the Universal Declaration of Human Rights and the toolkits for mainstreaming employment and decent work".</p>

ESP 5 Gender Equality and Woman's Empowerment.	<p>Gender Equality and Women's Empowerment is a cross-cutting issue in all the 14 SECAP Guidance Statements. ^[1]^[2]^[3]GS 11 – Development of value chains, micro- and small enterprises (MSEs) Well-designed value chain projects can drive improved natural resource management, climate resilience, gender equality, decent labor and working conditions, community health and safety, and poverty alleviation.</p> <p>Two key issues to manage in all value chain projects are (i) gender and (ii) food security (IFAD 2014). Different stages and functions of any value chain will be associated with gender-specific knowledge, assets, decision-making powers and responsibilities. Household food security and nutrition may be at risk in value chain designs that emphasize mono-cropping and commercial sales at the cost of local food access or labour demands. Additional good practices for IFAD's support to and promotion of value chain and MSE development might include: (i) gender-sensitive approaches to vocational training, business skills development, small-scale processing infrastructure, contract development and other value chain innovations; (ii) corporate social responsibility strategies that improve women's economic and decision-making position within value chains. Inclusion of youth is also a growing issue in value chains (UNIDO 2011), being carefully addressed in IFAD projects.</p> <p>Other IFAD policies that support and complement this principle are: Gender Equality and Women's Empowerment Policy, Rural Enterprise Policy, Rural Finance Policy, Private Sector Strategy, Improving Access to Land Tenure Security Policy, Engagement with Indigenous Peoples Policy, Targeting Policy, Youth Policy Brief, Climate Change Strategy.</p>
Principle 6 Core Labour Rights.	<p>Core Labour Rights is a cross-cutting issue in all the 14 SECAP Guidance Statements. ^[1]^[2]^[3]A robust SECAP process requires attention to social dimensions such as land tenure, ^[1]^[2]^[3]community health, safety, labour, vulnerable and disadvantaged groups, and historical factors, particularly in relation to natural resource management. One of the guiding values and principles for SECAP is to minimize adverse social impacts and incorporate externalities. Avoid and mitigate any potential adverse impacts on health and safety, labour and working conditions and well-being of workers and local communities. ^[1]^[2]^[3]</p> <p>GS 3 – Energy. ^[1]^[2]^[3]Gender-related differences and inequalities influence the outcomes of energy planning ^[1]^[2]^[3]projects. Attention should be given to women's time and labour constraints; women should be provided with opportunities to participate in decision-making regarding the development and adaptation of fuel-efficient technologies, and with the necessary technical skills to compete with men in green job opportunities. Giving women and men access to project participation can change overall gender inequality. The harnessing of rural renewable energy sources to create a rural energy market offers many opportunities for improving gender balance: field experience shows that many activities– such as commercial distribution, rural credit, marketing, training and agricultural work for securing feedstock for bio-energies – would benefit from increased entrepreneurship and leadership of rural women in the energy value chain. ^[1]^[2]^[3]</p> <p>GS 11 – Development of value chains, micro- and small enterprises (MSEs) With large private agribusinesses, IFAD project design teams and project implementers can refer to IFAD's principles under Private Sector Strategy (IFAD 2011a). These principles include ensuring that large and international companies that partner with IFAD comply with social and environmental standards, and are regularly assessed through due diligence during project preparation and implementation. ^[1]^[2]^[3]</p> <p>Other IFAD policies that support and complement this principle are: Gender Equality and Women's Empowerment Policy, Rural Enterprise Policy, Rural Finance Policy, Private Sector Strategy, Engagement with Indigenous</p>

	Peoples Policy, Targeting Policy, Youth Policy Brief, and Climate Change Strategy.
ESP 7 Indigenous people	<p>According to SECAP, when impacting indigenous peoples, the borrower or the grant recipient must seek FPIC from the concerned communities, document stakeholder engagement and consultation process and prepare an indigenous plan (IP). Whenever FPIC is not possible during project design, the FPIC implementation plan should specify how FPIC will be sought during early implementation. The FPIC plan and related documents must be disclosed in a timely and accessible manner at the QA or relevant stage during implementation.</p> <p>IFAD SECAP promotes the Indigenous Peoples Plan as a tool to ensure that the design and implementation of projects foster full respect for indigenous peoples' identity, dignity, human rights, livelihood systems and cultural uniqueness, as defined by the indigenous peoples themselves. It also ensures that the affected groups receive culturally appropriate social and economic benefits, are not harmed by the projects, and can participate actively in projects that affect them.</p> <p>Other IFAD policies that support and complement these principles: Indigenous People's Policy; Targeting Policy; Gender Policy; Climate Change Strategy</p>
ESP 8 Involuntary Resettlement	<p>Two Guidance Statements are related to Principle 8: GS 13 – Physical and economic resettlement; GS 8 – According to SECAP, when projects result in physical or economic displacement (affecting access and user rights to land and other resources), the borrower or grant recipient should obtain FPIC from the affected people, document stakeholder engagement and consultation process and prepare resettlement plans or frameworks. The documents must be disclosed in a timely and accessible manner at the QA or relevant implementation stage.</p> <p>Throughout the process of identification, planning, implementation and evaluation of the various elements of resettlement or economic displacement and their impacts, adequate attention will be paid to gender concerns: specific measures addressing the needs of female headed households, gender- inclusive consultation, information disclosure, and grievance mechanisms will be put in place in order to ensure that women and men will receive adequate and appropriate compensation for their losses and to restore and possibly improve their living standards.</p> <p>Other IFAD policies that support and complement this principle are: Gender Equality and Women's Empowerment Policy, Engagement with Indigenous Peoples Policy, Targeting Policy, Land Policy, ENRM Policy, Youth Policy Brief, Climate Change Strategy.</p>
ESP 9 Protection of Natural Habitats	<p>Six Guidance Statements are related to Principle 9: GS 6 – Rangeland-based livestock production; GS 7 – Water; GS 1 – Biodiversity; GS 3 – Energy; GS 5 – Forest Resources; GS 7 – Water:</p> <p>According to SECAP, Water-related projects requires projects to: (i) assess watershed protection needs and measures to preserve surface and underground water hydrology, and ensure water quality and supply within and adjacent to the project area; (ii) avoid detrimental changes in downstream water flow; (iii) limit erosion in watershed areas, intakes, waterways and reservoirs, including by designing all infrastructure to minimise scouring, sedimentation and stagnant water and to facilitate cleaning; (iv) Explore options for rewarding communities for watershed or ecosystem services (financially and non- financially) or benefit-sharing mechanisms.</p> <p>Other IFAD policies that support and complement these principles are: Environment and Natural Resources Management (ENRM) Policy; Land Policy; Climate Change Strategy.</p>

ESP 10 Conservation of Biodiversity	<p>GS 1 – Biodiversity^{[1][2][3][4][5][6][7][8][9][10][11][12][13][14][15][16][17][18][19][20][21][22][23][24][25][26][27][28][29][30][31][32][33][34][35][36][37][38][39][40][41][42][43][44][45][46][47][48][49][50][51][52][53][54][55][56][57][58][59][60][61][62][63][64][65][66][67][68][69][70][71][72][73][74][75][76][77][78][79][80][81][82][83][84][85][86][87][88][89][90][91][92][93][94][95][96][97][98][99][100]} IFAD can protect biodiversity by designing its projects appropriately, ensuring that they are implemented sustainably with full community participation, and providing sound recommendations for improving borrowing countries' agricultural policies, many of which are currently top-down. The following are the issues to be considered in this identification process: (i) Adopt an ecosystem perspective and multi-sectoral approach to development cooperation programmes; (ii) Promote fair and equitable sharing of costs and benefits from biodiversity conservation and sustainable use at all levels: local, national, regional and international; (iii) Encourage full stakeholder participation, including partnerships between civil society, government and private sector; (iv) Ensure that IFAD projects and programmes are consistent with the wider policy framework, and/or changes are made for supportive policies and laws; (v) Ensure that institutional arrangements are effective, transparent, accountable, inclusive and responsive; (vi) Provide and use accurate, appropriate, multidisciplinary information, accessible to, and understood by, all stakeholders; (vii) IFAD's investments should be sensitive to, and complement, local and national structures, processes and capacities.</p> <p>Mitigation activities to eliminate or reduce the negative impacts of a project on biodiversity should follow the following order of preference: (1) Complete avoidance of adverse impact; (2) Reduction of impacts on biodiversity where unavoidable; (3) Restoration of habitats to their original state; (4) Relocation of affected species; (5) Compensation for any unavoidable damage.</p> <p>Other IFAD policies that support and complement these principles are: Environment and Natural Resources Management (ENRM) Policy; Land Policy; Climate Change Strategy.</p>
ESP 11 Climate Change	<p>Climate change is a cross-cutting issue in all the 14 SECAP Guidance Statements^{[1][2][3][4][5][6][7][8][9][10][11][12][13][14][15][16][17][18][19][20][21][22][23][24][25][26][27][28][29][30][31][32][33][34][35][36][37][38][39][40][41][42][43][44][45][46][47][48][49][50][51][52][53][54][55][56][57][58][59][60][61][62][63][64][65][66][67][68][69][70][71][72][73][74][75][76][77][78][79][80][81][82][83][84][85][86][87][88][89][90][91][92][93][94][95][96][97][98][99][100]}. SECAP asks to incorporate climate change risk analysis into projects, which are subject to an environmental, social and climate risk screening, and are assigned a risk category for climate vulnerability (high, moderate, low)^{[1][2][3][4][5][6][7][8][9][10][11][12][13][14][15][16][17][18][19][20][21][22][23][24][25][26][27][28][29][30][31][32][33][34][35][36][37][38][39][40][41][42][43][44][45][46][47][48][49][50][51][52][53][54][55][56][57][58][59][60][61][62][63][64][65][66][67][68][69][70][71][72][73][74][75][76][77][78][79][80][81][82][83][84][85][86][87][88][89][90][91][92][93][94][95][96][97][98][99][100]}.</p> <p>GS 7 – Water^{[1][2][3][4][5][6][7][8][9][10][11][12][13][14][15][16][17][18][19][20][21][22][23][24][25][26][27][28][29][30][31][32][33][34][35][36][37][38][39][40][41][42][43][44][45][46][47][48][49][50][51][52][53][54][55][56][57][58][59][60][61][62][63][64][65][66][67][68][69][70][71][72][73][74][75][76][77][78][79][80][81][82][83][84][85][86][87][88][89][90][91][92][93][94][95][96][97][98][99][100]} In the case of water irrigation projects, the potential impacts of climate change on water availability should be thoroughly examined when designing any type of intervention – climate moisture index, local climate variability data and projections can be very useful in this regard. Projects in areas prone to floods, drought and other natural disasters often require explicit incorporation of climate change effects into economic analysis, including assessment of the cost of adaptation and measures for reducing vulnerability at the river basin or watershed level (World Bank, 2009). Multiple-benefit approaches or technologies that have positive impacts on climate resilience, yields and soil moisture, such as rainwater harvesting and conservation agriculture, should be promoted^{[1][2][3][4][5][6][7][8][9][10][11][12][13][14][15][16][17][18][19][20][21][22][23][24][25][26][27][28][29][30][31][32][33][34][35][36][37][38][39][40][41][42][43][44][45][46][47][48][49][50][51][52][53][54][55][56][57][58][59][60][61][62][63][64][65][66][67][68][69][70][71][72][73][74][75][76][77][78][79][80][81][82][83][84][85][86][87][88][89][90][91][92][93][94][95][96][97][98][99][100]}.</p> <p>GS 11: Development of value chains, micro- and small enterprises (MSEs): From a climate perspective, additional good practices for IFAD's support to and promotion of value chain and MSE development might include: (i) development of early warning systems and contingency plans for climate shocks and extreme events across the full value chain including transport and storage; (ii) introduction of protective features and reinforcements into the design of critical infrastructure to handle higher maximum water run-off and higher temperatures; (iii) inclusion of climate criteria in corporate standards and protocols; (iv) financial channels to reduce risks associated with innovation (e.g. microfinance, small grants programs, index-based weather insurance); (v) renewable energy sources to cover changing requirements for grain processing, fish drying and other value-adding activities; (vi) use of hazard exposure and crop suitability maps to inform siting of processing facilities; (vii) harmonization with national climate change policies and international commitments; (viii) strengthened capacity for good practices, including building stronger knowledge systems and institutions for</p>

	ongoing adaptation to progressive climate change; and (ix) incorporation of measurable climate change mitigation practices where relevant, that reduce greenhouse gas emissions, such as agroforestry, measures to increase soil carbon, and efficiency measures in the value chain that reduce output to input ratios for materials, energy and water (IFAD 2015). Reductions in greenhouse gas emissions should be measured where technically and financially feasible. The FAO EX-ACT tool is a good example already being used in some IFAD projects.
ESP 12 Pollution Prevention and Resource Efficiency.	<p>Five Guidance Statements are related to Principle 8: GS 6 – Rangeland-based livestock production; GS 7 – Water; GS 1 – Biodiversity; GS 3 – Energy; GS 5 – Forest Resources; GS 2 - Agrochemical.</p> <p>GS 2 – Agrochemicals. Whenever an IFAD project includes the purchase, promotion or use of agrochemicals, environmental analysis should seek to address the following issues: (i) Identification of specific crops and their existing or potential pests requiring pest management; (ii) Identification of nationally approved and available pesticides, and management and application techniques for their judicious and effective use to protect human and environment health; (iii) Assessment of local and national capacity for the safe handling, use, storage, disposal and monitoring of agrochemicals; (iv) Development of an IPM programme for minimizing /optimizing pesticide application, including – if possible – provisions for monitoring residues on crops and in the environment; (v) Reduction of environmental impact.</p> <p>GS 7 – Water (Agriculture and domestic use) Issues to be addressed in the design phase:</p> <p>(a) Watershed protection: Preserve surface water and underground water hydrology, and ensure water quality and supply within and adjacent to the project area. Avoid detrimental changes in downstream water flow. Limit erosion in watershed areas, intakes, waterways and reservoirs, including by designing all infrastructure to minimize scouring, sedimentation and stagnant water and to facilitate cleaning. Explore options for rewarding communities for watershed or ecosystem services (financially and non-financially) or benefit-sharing mechanisms.</p> <p>(b) Participation of target groups and equitable distribution of benefits: Consult all local water users, and involve beneficiaries in all stages of infrastructure development, from design through operation and management, to rehabilitation and reconstruction. Ensure equitable, reliable and sustained access to, and use and control of, water. Address the gender dimensions in all stages.</p> <p>(c) Climate change: Incorporate climate change risk analysis into projects; the potential impacts of climate change on water availability should be thoroughly examined when designing any type of intervention – climate moisture index, local climate variability data, and projections can be very useful in this regard. Projects in areas prone to floods, drought and other natural disasters often require explicit incorporation of climate change effects into economic analysis, including assessment of the cost of adaptation and measures for reducing vulnerability at the river basin or watershed level (World Bank, 2009). Promote multiple-benefit approaches or technologies that have positive impacts on climate resilience, yields and soil moisture, such as rainwater harvesting and conservation agriculture.</p> <p>Other IFAD policies that support and complement these principles are: Environment and Natural Resources Management (ENRM) Policy; Land Policy; Climate Change Strategy.</p>
ESP 13 Human Health	GS 14: Human health. When community health is significantly affected, a health-impact assessment must be conducted and mitigation measures included in the project design.

ESP 14 Physical and Cultural Heritage.	<p>GS 9 – Physical cultural resources (PCR) According to SECAP, the borrower will address PCR in programmes/projects financed by IFAD in the context of the environmental and social assessment (ESA) process established by IFAD's SECAP. The SECAP prescribes general steps for programmes/ projects that apply in cases involving PCR: screening; collecting data; assessing impacts; and formulating mitigating measures.</p> <p>Other IFAD policies that support and complement this principle are: Gender Equality and Women's Empowerment Policy, Engagement with Indigenous Peoples Policy, Targeting Policy, ENRM Policy, Climate Change Strategy.</p>
ESP 15 Lands and Soil Conservation.	<p>Three Guidance Statements are related to Principle 15: GS 5 – Forest Resources; GS 6 – Rangeland-based livestock production; GS 7 – Water (Agriculture and domestic use);</p> <p>IFAD has demonstrated a firm commitment towards land, soil and water conservation as detailed under ESP 15 in section III below.</p> <p>Other IFAD policies that support and complement these principles: Land Policy; Targeting Policy; ENRM Policy; Climate Change Strategy.</p>

II. Environmental and Social Impact Assessment

Principle 1: Compliance with the Law

There is no risk when it comes to the project's compliance with the national laws and regulations. All the project's components are being executed by government entities and continuous consultations on compliance are being followed. The project will specifically comply with the following laws:

Law/Technical Standard	Relevant Component(s)	Compliance Mechanism
Water Law No.77 of 2018 ²⁹	Components 1 and 3	Coordination with the Ministry of Energy and Water and the Ministry of Environment prior to and during the implementation including on operation and maintenance issues.
Environmental Impact Assessment Decree No. 8633 of 2012 ³⁰ .	Components 1, 2 and 3. The type and/or scale of most activities of the project do not require detailed EIA. Activities under output 3.2 will go through the initial screening of the Ministry of Environment to determine the level of EIA if any.	Close coordination with the Ministry of Environment who is executing component 4.
Environmental Protection Law No.444 of 2002	All	Close coordination with the Ministry of Environment who is executing component 4.

²⁹ Issued after AgriCAL's approval.

³⁰ Issued during AgriCAL's approval process.

Resolution No. 471/1 of 2006 abrogating Resolution No. 52/1 of 2000 regulating the establishment, production and control of private nurseries in Lebanon.	Component 3	Ministry of Agriculture is the executing entity for component 3.
<u>Output</u>	<u>Law/Technical Standard</u>	<u>Compliance Mechanism</u>
<u>Output 1.1: Rainwater harvested from greenhouse roof tops</u>	<ul style="list-style-type: none"> • <u>Water Law No.77 of 2018³¹</u> • <u>National Guideline for Rainwater Harvesting Systems</u> • <u>Environmental Impact Assessment Decree No. 8633 of 2012³²</u> • <u>Environmental Protection Law No.444 of 2002</u> 	<p><u>The Ministry of Environment (MoE) is overseeing this activity and will sign the MoU with the two farmers whose land host the two pilots for rainwater harvesting from greenhouse roof top to ensure operation and maintenance arrangements are in place. MoE ensures compliance to environmental impact assessment process and the related laws. The type and/or scale of most activities of the project do not require detailed EIA.</u></p> <p><u>In addition, the ongoing coordination with the Ministry of Energy and Water (MoEW) ensures compliance to the water law and the National Guideline for Rainwater Harvesting Systems.</u></p>
<u>Output 1.2: Water efficient irrigation systems deployed</u>	<ul style="list-style-type: none"> • <u>Water Law No.77 of 2018³³</u> • <u>Municipal Law decree 118/77</u> • <u>Environmental Impact Assessment Decree No. 8633 of 2012³⁴</u> • <u>Environmental Protection Law No.444 of 2002</u> 	<p><u>The ongoing coordination between Green Plan and the MoEW ensures compliance to the Water Law. All the necessary permits are issued by the contractors according to the Municipal Law as stipulated in the contracts for water networks. The ongoing coordination with municipalities and WUAs will ensure that the operation and maintenance arrangement are well in place after the project completes.</u></p> <p><u>Also the presence of the MoE as an Executing Entity in the project ensures following the environmental</u></p>

³¹ Issued after AgriCAL's approval.

³² Issued during AgriCAL's approval process.

³³ Issued after AgriCAL's approval.

³⁴ Issued during AgriCAL's approval process.

		<u>protection law. Finally, the type and/or scale of most activities of the project do not require detailed EIA.</u>
<u>Output 3.1: Community-based sustainable rangeland management plans prepared</u>	<ul style="list-style-type: none"> • <u>Forest Code of 1949</u> • <u>Law 85 for the protection of forests was promulgated in 1991 and amended by law 558 in 1996.</u> • <u>Land Resources: Decree 2366/2009</u> 	<u>The rangeland management plans are being executed by the Directorate of Rural Development and Natural Resources (DRDNR) under the Ministry of Agriculture (MoA) who will follow the forest and land laws during the formulation process and supervise the implementation of the plans. The rangeland management plans will detail all the aspects of operation and maintenance based on the participatory approach outcomes.</u>
<u>Output 3.2: Restored degraded rangeland areas</u>	<ul style="list-style-type: none"> • <u>Water Law No.77 of 2018³⁵</u> • <u>Municipal Law decree 118/77</u> • <u>Land Resources: Decree 2366/2009</u> • <u>Environmental Impact Assessment Decree No. 8633 of 2012³⁶</u> • <u>Environmental Protection Law No.444 of 2002</u> • <u>Resolution No. 471/1 of 2006 abrogating Resolution No. 52/1 of 2000 regulating the establishment, production and control of private nurseries in Lebanon.</u> 	<p><u>The ongoing coordination between MoA and MoEW ensures compliance to the Water Law. All the necessary permits are issued by the contractors according to the Municipal Law as will be stipulated in the contracts. The MoA the will ensuring following the land law in all the output's interventions as well as the resolution on establishing nurseries where relevant. The MoA will ensure maintenance of the infrastructure and ensure rangeland restoration is monitored.</u></p> <p><u>Also the presence of the MoE as an Executing Entity in the project ensures following the environmental protection law. The MoE will ensure that the construction works are screened as part of the Environmental Impact Assessment process and then advise on the necessary studies and documents accordingly.</u></p> <p><u>See the figure below on the EIA process.</u></p>

³⁵ Issued after AgriCAL's approval.

³⁶ Issued during AgriCAL's approval process.

The project team with its strong ties with the government continues to monitor and abide to any relevant new laws and/or technical standards. IFAD as an implementing entity will ensure the project's compliance through its supervision process.

Principle 2: Access and Equity

There is some risk related to access to irrigation water from the hill lakes especially for farmers downstream. In addition to the networks established from the hill lakes, the project will invest in drip irrigation equipment to increase water-use efficiency which might create conflict for some farmers who are not selected for drip irrigation. To address this risk, Ccommunity consultations took place with project beneficiaries for each project activity / output to identify possible rivals, disputants and concerns related to equal access of project benefits. In that way, equal allocation and distribution of project benefits is ensured during project execution. There will be neither discrimination nor favouritism in accessing project benefits. The reallocations made to component 1 allows AgriCAL to provide equal access to all 698 beneficiaries for on-farm irrigation so as not to create any conflict within the community. The risk and the mitigation measure were incorporated into the ESMP.

Component 2 will focus more on women and youth and measures to avoid their exclusion have been added to the ESMP. The participatory approach to rangeland management plans formulation ensure equal access for community individuals and groups to project benefits under component 3.

Principle 3: Marginalised and Vulnerable Groups

Due to a combination of COVID-19, the Beirut blast, political instability and the refugee crisis, the number of marginalised and vulnerable groups have significantly increased over the last couple of years. Currently, the United Nations World Food Programme is providing assistance to 1,680,859 beneficiaries through cash-based transfers and family food parcels. Out of these beneficiaries, 498,180 beneficiaries are vulnerable Lebanese, 1,175,089 Syrian refugees and 7,590 refugees of other nationalities. Where both the vulnerable Lebanese as well as refugees are affected by the extreme high levels of inflation and economic downturn, the situation is especially dire for the Syrian refugees that are often employed in precarious jobs and have few assets. The ESMP has been updated to and includes risks for vulnerable and marginalized groups. Due care has been provided to the risks for vulnerable and marginalized groups during for example community consultations and the participatory approach. Risks for marginalized and vulnerable groups have also been discussed with the stakeholders such as UNWOMEN.

Principle 4: Human Rights

Recent Special report missions include a Report of the Special Rapporteur on freedom of religion or belief on his mission to Lebanon (2015) and Report of the Special Rapporteur on contemporary forms of slavery, including its causes and consequences, Gulnara Shahinian (2012). Both reports do not make explicit references or recommendations in relation to the agricultural sector. Human rights were an explicit part of the community consultations. In addition, human rights are also discussed with beneficiaries during for example the participatory approach used in the rangeland component. A recently released compendium to defend and promote the rights of family farmers has been released with the PMU. Some elements of the successful implementation of the project could further advance the human rights agenda such. The right to private property will be promoted by the successful implementation of the rangeland component and the right to food could be promoted by multiple activities in the projects such as irrigation activities, climate risk reduction and knowledge management.

Principle 5: Gender Equality and Women's Empowerment

Lebanon ratified major legal conventions supporting gender equality such as the CEDAW. In spite of that, Lebanon still faces major challenges in terms of gender equality. Political participation of women in the political domain remains well below with only 4.7% of women occupying seats in parliament and the human development index of women stands at 0.691 (vs. 0.774 for men). Although Lebanon scores well on certain development indicators such as

literacy and schooling rates, overall the women have lower scores on these indicators than men in particular in rural areas. Gender stereotyping persists and workloads are often based on traditional gender roles especially in rural areas. Domestic chores and processing are mostly done by women whilst primary production is male dominated task. The Lebanese economic meltdown has further exacerbated gender relations with women for example leaving private education when their families are no longer able to support their tuition fees.

In order ensure that women and men benefit equally from project interventions, gender considerations are an integral part of project design and implementation. Gender analysis have been included in background studies including, feasibility studies, rangeland management plans and social-economic analysis. Activities will be implemented bearing local gender considerations into account and where needed for example female only training moments will be organized in close proximity to the homestead. To ensure that the voice of female beneficiaries is heard during the implementation process, local female leaders have been included in the boards of for example local institutions. A well-functioning feedback mechanism will allow the project to receive feedback from women on a continuous basis. All staff in the PMU have been trained on gender equality and women's empowerment issues. A detailed matrix with gender considerations per activity has been included as part of the targeting strategy.

Additional gender analysis have been executed and a gender matrix has been developed and added to Annex 3 of this document in order to ensure Gender Equality and Women's Empowerment.

Principle 6: Core Labour rights

Lebanon is currently ratifying 7 out of 8 fundamental ILO conventions, 2 out of the 4 governance conventions and 42 of 178 technical conventions. AgriCAL ensures that all project activities meet the core labour rights by identifying relevant conventions relevant to the project which are not safeguarded through national law. Provisions to safeguard them are included in project contracts. Communities have also been consulted about possible labour issues during for example participatory approached with a view to implement the activities accordingly.

-Agriculture: Lebanon has not ratified C129 - Labour Inspection (Agriculture) Convention, 1969 (No. 129)

-Construction: Lebanon has not ratified C167 - Safety and Health in Construction Convention, 1988 (No. 167)

-Migrant workers: Lebanon has not ratified C143

-Migrant Workers (Supplementary Provisions) Convention, 1975 (No. 143)

-Women: Lebanon has not ratified: P089 - Protocol of 1990 to the Night Work (Women) Convention (Revised), 1948

Principle 7: Indigenous Peoples

The project ensures that all activities- including the proposed changes- are consistent with the rights and responsibilities set forth in the UN Declaration on the Rights of Indigenous Peoples by ensuring that possible issues are identified and prevented. The project determined that no indigenous people are present in the project target areas. This has been determined through expert and community consultations.

Principle 8: Involuntary resettlement

None of the project's accomplished, ongoing or upcoming- including the proposed changes- activities involve any type resettlement for any of the communities in the target areas. No interventions took place/will take place without the consent of inhabitants in the targeted areas.

Principle 9: Protection of Natural Habitats

None of the project interventions- including the proposed changes- will cause any unjustified conversion or degradation of critical natural habitats will take place because of project activities. It has been checked if any critical natural habitats exist in the target location, including their location, characteristics and critical value. None of the project's activities will be carried out in a critical natural habitat according to the IUCN red list as well as common and traditional knowledge. This was confirmed through consultations with IUCN (regional office) and the Ministry of Environment.

Principle 10: Conservation of Biological Diversity

The project ensures that any significant or unjustified reduction or loss of biological diversity because of project activities- including the proposed changes- will be avoided. It has been checked if any important biodiversity exist in the target location, including their protection status and other recognised inventories as well as possible negative impacts on these due to project activities. According to the IUCN red list and UNESCO Man and the Biosphere Programme reserve, no sensitive biospheres are located in the target areas. This was confirmed through consultations with IUCN (regional office) and the Ministry of Environment. The project will not also introduce any invasive species in the rangeland management component.

Principle 11: Climate Change

The project activities- including the proposed changes- will not result in any significant increase in greenhouse gas emissions or other drivers of climate change. On the contrary, the investments in community-based rangeland management is expected to increase the productivity of the livestock sector in the target areas without the need to increase the herd size.

Principle 12: Pollution Prevention and Resource Efficiency

No significant pollution issues foreseen as a result of project activities- including the proposed changes. In all cases and as mentioned under Principle 1, the project is constantly following the EIA process as per Lebanese national law.

In terms of resources efficiency, the project will pose no risk. On the contrary, the project is increasing resource efficiency. The irrigation networks from the hill lakes will increase the efficiency of water use in agricultural activities. Moreover, the participation of communities in rangeland management will foster its efficiency and sustainability while increasing the productivity of livestock. In addition, the rehabilitation of Abdeh nursery will improve its benefits by providing seedlings to the surrounding communities.

Principle 13: Public Health

As of the 13th of December 2021, the number of confirmed COVID-19 cases in Lebanon reached 683,326 with 8,804 people dead as per the WHO's dashboard³⁷. The pandemic continues to be a global threat to people's health and world economies with new strains emerging. The risk remains higher in rural areas where the awareness tends to be less than in cities. AgriCAL has already suffered a lot of delays due to COVID-19 restrictions in addition to the political and economic challenges.

However, the project itself can aggravate the risk of spreading the virus during executing its activities especially the ones involving community mobilization, field days, trainings and workshops. Project activities that involve community mobilization, meetings, workshops or stakeholder participation may pose a threat of widespread infections. The project will continue to monitor the situation as it has done in 2020 and 2021 taking all the safety precautions in alignment with WHO guidelines and all the national guidance on the matter. Where relevant and without undermining the project's objectives, the PMU will use online tools for meetings and consultations to the extent possible. The project will mainstream public health awareness, proper waste management and hygiene issues in all capacity building activities of the project especially field days. It will also ensure that service providers follow national health and safety regulations at workplace. These mitigation measures have been included in the updated ESMP with the appropriate monitoring mechanism in place.

³⁷ WHO (2021). Lebanon's COVID-19 dashboard. Last Accessed = 13/12/2021
[<https://covid19.who.int/region/emro/country/lb>]

Principle 14: Physical and Cultural Heritage

Lebanon has 5 locations listed by UNESCO as World Heritage (Anjar, Baalbek, Byblos, Tyre and Ouadi Qadisha (the Holy Valley) and the Forest of the Cedars of God). In addition, 10 sites were added in 2019 on the tentative list (<https://whc.unesco.org/en/statesparties/lb>). Anjar and Byblos are the only sites where the project will intervene where it will only collect samples for the National Fodder Assessment and where the two pilot rainwater harvesting from greenhouses have been installed with no risks foreseen after a rapid screening. None of the project activities- including the proposed changes- will take place near any of the other 13 sites so no risk is foreseen on physical heritage.

In addition, the project activities will all occur in consultation with communities especially most vulnerable groups (e.g. women). No negative impact on the cultural heritage. On the contrary, project activities will help these communities adapt to climate change and make their traditional livelihoods more resilient.

Principle 15: Lands and Soil Conservation

The project ensures that no negative impacts on lands and soil will result from project activities- including the proposed changes. No areas of fragile soils or valuable lands have been identified among the target areas. No major excavations will take place.

On the other hand, the proposed interventions under component 3 may pose some risk on the land around the targeted watershed. The Installation of 9 hafeers (270,000 m³), stone check dams (9600 m³), and gabions (1300 m³) and contour line walls (15,000 linear meter) may have a negative impact on land as a result of the construction works involved. This may impact the land's ability to provide its ecosystem services around two watersheds Al-Qaa watershed and the surrounding area in Baalbak caza and Wadi Al-Karem, Dabour and the surrounding areas in Hermel (i.e. Faara). However, the project will ensure that all the construction works follow the Environmental Impact Assessment Process supervised by the Ministry of Environment according to Decree No. 8633 of 2012 as integrated in the ESMP. Consultations with communities in these areas concluded that flood risk management is an absolute priority to protect the rangelands and thus these interventions are required. The development of the rangeland management plans will ensure the sustainability of these interventions and the involvement of communities in decision-making.

On the contraryIn general, the project aims to enhance sustainable land and soil use for agriculture and livestock activities. The project is now finalising the "Guidelines and recommendations on agricultural adaptation techniques for vulnerable areas developed" and building capacities on climate smart agriculture which will improve soil conservation and land-use.

III. Environmental and Social Management Plan (ESMP)

The original AgriCAL project that was approved in 2012 did not have an elaborate Environmental and Social Management Plan (ESMP) since Adaptation Fund's Environmental and Social Policy (ESP) was only adopted in 2013 and IFAD's Social, Environmental and Climate Assessment Procedures (SECAP) guidelines were first introduced in 2014. However, it is important to ensure compliance to AF's 15 principles as well as SECAP principles (see alignment table above) in the remaining period of the project.

The project is executed through government entities which ensures compliance to the law and access to all national stakeholders including line ministries. The presence of Ministry of Environment on board as the EE for component 4 ensures the PMU's continuous contact with the Ministry and facilitates guidance on the EIA process.

Due to Lebanon's volatile situation, the ESMP remains a live document that will be continuously monitored by the PMU and EEs. Ongoing community and stakeholder consultations will help the project identify any emerging risks and define- with support from IFAD- appropriate mitigation measures and verification methods. The cost of the implementation of the ESMP is embedded in the budget of the relevant outputs respectively. Monitoring, evaluation and documentation of ESMP implementation will be the responsibility of the Project Coordinator who will ensure that implementation of the ESMP by the respective EEs. IFAD's implementation support and supervision missions will ensure the project's compliance to the ESMP. Progress on ESMP including any new risks and mitigation measures identified will be reported to the Adaptation Fund through the annual PPR.

ESMP Matrix

Intervention	Environmental/Social Risks	Recommended Mitigation Measures	Public Consultation Activities	Responsible Entity in Execution Phase	Means of Verification (Monitoring and Reporting)	Frequency of Verification	Cost
All Interventions	All possible adverse environmental and social impacts as a result of the AgriCAL's activities.	<p>(1) Apply strictly the Grievance and Redress Mechanism (GRM).</p> <p>(2) Ensure dissemination of the GRM to local communities during consultations.</p> <p>(3) Maintain solid documentation for the received complaints during the operation of the project and track the level of responsiveness (provision of feedback).</p>	Participatory meetings with communities including capacity building activities.	PMU	<p>(1) Review of the number of complaints received.</p> <p>(2) Review of the number of complaints solved, the mechanisms used and the time it took to solve them.</p>	Monthly	Embedded in PEC.

All Interventions	Beneficiary dissatisfaction and discrimination	In addition to applying the GRM, carrying out community consultations with the most vulnerable groups (especially women) prior to and during the implementation of activities is key to avoiding beneficiary dissatisfaction.	Community focus groups.	PMU and EEs	Attendance sheets and photos of community consultations.	Whenever available.	Embedded in cost of outputs.
All Interventions	The project's activities unintentionally aggravate public health concerns in the target areas with regards to COVID-19	<p>(1) All safety precautions (including masks, use of disinfectants, etc.) should be exercised during all activities.</p> <p>(2) Public health awareness, proper waste management and hygiene issues mainstreamed</p>	Stakeholder meetings with EEs.	PMU and EEs.	<p>(1) Review reports of capacity building activities to ensure health issues were discussed.</p> <p>(2) Review complaints by workers during execution.</p>	Annually	Embedded in costs of outputs.

		<p>in all capacity building activities of the project especially field days.</p> <p>(3) Ensuring that service providers follow national health and safety regulations at workplace.</p>					
All Interventions	<u>Social:</u> Women, youth and other vulnerable categories such as refugees are excluded from project benefits	Incorporate the results of community consultations with most vulnerable groups into the implementation of activities in collaboration with EEs.	Consultations with most vulnerable and marginalised groups.	PMU and EEs.	Collection of data for indicators is disaggregated by sex, age and vulnerable groups where relevant.	Monthly	No extra budget needed.
All Interventions	<u>Social:</u> Gender Issues and all forms of Gender-Based Violence, including sexual	(1) Incorporate the results of gender-sensitive and participatory consultations into	Consultations with women groups.	PMU and EEs.	(1) Collect gender-disaggregated monitoring and evaluation data to track the extent to which women have	Annually	Embedded in costs of outputs.

	harassment due to the increasing mobilisation of women to participate in project activities	<p>implementation of activities.</p> <p>(2) Create female only spaces for women to receive trainings and services.</p>			<p>been able to participate and benefit from project activities.</p> <p>(2) Cases of sexual harassment has to be dealt with in compliance with IFAD's Policy to Preventing and Responding to SH/SEA and reported directly to IFAD.</p>		
All Interventions	<p><u>Social:</u></p> <p>Child labour used in project's activities.</p>	<p>(1) Raise awareness among EEs on not using child labour.</p> <p>(2) Strictly apply GRM.</p>	Stakeholder meetings with EEs.	PMU and EEs	Review child labour complaints in compliance with GRM	Annually	No extra budget needed.

Component 1: Water Management

Output 1.1: Rainwater harvested from greenhouse roof tops	<u>Environmental:</u> Pilot rainwater harvesting from greenhouse roof tops are not sustainable beyond the project's life.	While there is verbal commitment from the two farmers to provide the demonstration services, the project will formalise commitment in a written memorandum of understanding, which also includes the minimum time frame (e.g.5 years), timings of being open to other farmers and degree of involved in the demonstration by the irrigation owners.	Meeting with the two farmer beneficiaries.	PMU	MoU with the two farmers.	In the remaining project period.	Embedded in the cost of output 1.1.
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Output 1.3: Water efficient irrigation systems deployed	<u>Environmental and Social:</u> Conflict among farmers due to exclusion of some hill lake beneficiaries from on-farm irrigation networks.	The reallocated budget allows for the inclusion of all 698 farmers in the areas of the hill lakes.	N/A	PMU and Green Plan.	Review beneficiaries' database as part of filling the logframe.	During implementation of output 1.3.	Embedded in the cost of output 1.3.
<u>Output 1.3: Exclusion of vulnerable groups from project activities.</u>	<u>Social:</u> Vulnerable groups are excluded from project activities.	1) Economic baseline studies have been conducted to assure targeting of the most vulnerable groups able to benefit from this activity. 2) Strictly apply GRM.	Meetings with beneficiaries during the mission.	PMU and greenplan.	Review of beneficiary database as well as outcome studies	1) Already conducted prior to the implementation of output 1.3 2) During the implementation of component 1.3	Embedded in the cost of output 1.3.

Component 2: Adaptation Techniques Roll-out

Output 2.1: Enhanced early warning system to farmers through improved existing system	<u>Social:</u> Beneficiaries not aware of the smart phone application and thus not benefitting from the Early Warning System.	Budget included for introducing the smart phone application to communities/ farmers in some areas and giving a simple training on how to use it.	Meetings with communities.	PMU and LARI.	Review meeting with selected communities on the smart phone application.	During implementation of output 2.3.	Embedded in the cost of output 2.3.
Output 2.2: Expanded farmer outreach and ensured financial and management sustainability of the warning system	<u>Environmental:</u> The system is not sustainable due to the volatility of the economic situation.	The project will prepare a private sector engagement strategy that LARI will use as basis of ensuring sustainability beyond the project lifetime.	Meetings with relevant private sector entities.	PMU and LARI.	Publication of the strategy.	In the remaining project period.	Embedded in the cost of output 2.2.
Output 2.3 Capacity building on adaptation techniques for vulnerable field crops enhanced	<u>Social:</u> Exclusion of youth and women from the capacity building and field days.	Follow the results of consultations with most vulnerable groups and apply the targeting strategy.	N/A	PMU and LARI.	Sex and age disaggregated data of beneficiaries of output 2.3.	Monthly	No extra budget needed.

Output 2.4 Guidelines and recommendations on agricultural adaptation techniques for vulnerable areas developed	<u>Social:</u> The guidelines are too academic and not readable to policymakers or the public.	Prepare a summary for policymakers that synthesises the guidelines in a simplified language.	N/A	PMU and LARI.	Publication of the summary for policymakers.	In the remaining project period.	Embedded in the cost of output 2.4.
Output 2.5: Fodder resource assessment prepared	No environmental or social risks foreseen. Any emerging risks will be identified and added to the ESMP. Changes to ESMP will be document and reported as part of the PPR.						
Component 3: Rangeland Management							
Output 3.1: Community-based sustainable rangeland management plans prepared	<u>Social:</u> Negligible role for youth and women in rangeland management plans	Participatory approach should ensure fair representation of women and youth.	Meetings with women and youth focus groups as part of the participatory approach.	PMU and MoA	Review of community based sustainable rangeland management plans to assess gender and youth mainstreaming	After drafting the sustainable rangeland management plans.	Embedded in the cost of output 3.1.
Output 3.2: Restored degraded rangeland areas and reduced flood risks	<u>Environmental:</u> (1) Negative environmental impact due to construction of	(1) Construction will follow the EIA process in compliance with Environmental Impact	(1) Meeting with the Ministry of Environment regarding the EIA requirements.	PMU, MoA and MoE.	(1) EIA documentation. (2) Report of meeting with communities	In the remaining project period.	Embedded in the cost of output 3.2.

	dams, hafeers and gabions. <u>Social:</u> (2) Seedlings from Abdeh nursery being stolen/damaged.	Assessment Decree No. 8633 of 2012 (see compliance to principle 1). <u>Adequate supervision will be ensured during construction works.</u> (2) Construction of fences around the nursery.	(2) Meeting with communities around Abdeh nursery.		around Abdeh nursery.		
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Component 4: Climate Index-based Insurance, Policy and Knowledge Management

Output 4.2 Policy advocacy activities implemented	No environmental or social risks foreseen. Any emerging risks will be identified and added to the ESMP. Changes to ESMP will be document and reported as part of the PPR.
Output 4.3 Knowledge management system established	No environmental or social risks foreseen. Any emerging risks will be identified and added to the ESMP. Changes to ESMP will be document and reported as part of the PPR.

IV. Grievance and Redress Mechanism (GRM)

IFAD-supported projects and programmes are designed in a participatory process thus taking into account the concerns of all stakeholders. IFAD works to ensure that all IFAD investments are implemented in accordance with the Fund's policies, standards and safeguards. IFAD considers it equally important that parties adversely or potentially adversely affected by IFAD-supported projects and programmes should be able to bring issues to the Fund's attention.

IFAD's Grievance Redress Mechanism (GRM) can be accessed when necessary to manage project-related grievances that cannot be resolved by the project's Executing Entity. The purpose of the GRM is to provide a complaints procedure for alleged non-compliance with Adaptation Fund's social and environmental policies and mandatory aspects of IFAD's Social, Environmental and Climate Assessment Procedures (SECAP). IFAD's Complaints Procedure aims to serve as an accountability mechanism with a clear entry point and transparent process for people and communities to raise concerns with IFAD-supported projects and to provide effective sustainable solutions. Its mandate is to: i) facilitate the resolution of complaints from people who may be affected by projects or subprojects in a manner that is fair, objective and constructive; ii) enhance the environmental and social outcomes of projects; and iii) foster public accountability and learning to enhance the environmental and social performance of IFAD and reduce the risk of harm to people and the environment. The Procedure is organized in two complementary functions:

- Problem solving function: to help resolve issues raised about the environmental and/or social impacts of project through a neutral, collaborative, problem-solving approach and contribute to improved social and environmental outcomes of the project.
- Impartial review function: to carry out reviews of IFAD's compliance with its SECAP and other related policies, assess harm done, and recommend remedial actions where appropriate.

Project-level GRM

The project team will establish communication channels at field level to file complaints. Contact information (including contact postal code, phone number and/or email) and information on the process to file a complaint will be disclosed in all meetings, workshops and other related events throughout the life of the project. The project will include in the upcoming capacity building activities information on the GRM.

The project-level GRM and guidelines for AgriCAL takes into account IFAD's corporate Complaints Procedure to receive and facilitate resolution of concerns and complaints with respect to alleged non-compliance of its environmental and social policies and the mandatory aspects of its SECAP. The project will also be responsible for documenting and reporting to IFAD and the Adaptation Fund as part of the safeguards performance monitoring on any grievances received and how they were addressed.

Complaints can be raised directly to the Project Management Unit (PMU) representative at the district level at the concerned project area and the field team should help the complainant fill the complaint ensure the following information is included:

- Name and contact details of the person(s) (and/or their representative) or community affected by AgriCAL;
- Clear statement of AgriCAL's adverse impact(s). This includes direct and material harm which can be actual present harm, or harm that is expected in the future;
- Whether the complainants wish to keep their identity confidential.

Level 1

Submitted complaints will be sent to the Project Coordinator (at the PMU) and M&E officer to assess whether the complaint is eligible. Project Coordinator will inform and incorporate the technical specialists as required. Eligible complaints will be addressed by the executing entity at the field level (see eligibility criteria below). The Project Coordinator- with support from the M&E Officer- will be responsible for recording the grievance and how it has been addressed if a resolution was agreed.

Level 2

If the grievance is not resolved at the field level, it should be escalated to the PMU. The PMU should consult the Ministry of Agriculture and Ministry of Environment on the appropriate action. Received complaints will be registered, investigated and solved by the PMU.

Level 3

If the complaint has not been solved in level 2, the complaint must be submitted to IFAD by downloading the complaint form (<https://www.ifad.org/documents/38711624/40169860/IFAD+Complaints+Submission+Form+Final+Draft+%28Downloadable%29.docx/52c75cad-439f-4e4a-8a70-45056ebde826>) and sending an email to SECAPcomplaints@ifad.org or a mail to:

IFAD

SECAP Complaints (PMD)

Via Paolo di Dono 44

00142 Rome, Italy

The full complaint procedure at IFAD is stipulated in the sections below.

Complaints can be submitted in any language by letter, e-mail and/or web form (available on IFAD's website). Any communication thereafter will be in English with a translation into Arabic. Processing of complaints not submitted in English may require additional time due to the need for translation. IFAD will timely notify the complainant of any delays caused by translation.

When a complaint is received, IFAD will first assess its admissibility. For complaints to be considered, the following eligibility criteria must be met:

- The complainant alleges that IFAD has failed to implement its or Adaptation Fund's social and environmental policies;
- The complainant alleges that they have been or will be adversely affected or harmed (direct or material) as a result of such non-compliance;
- The complainant must be submitted by a group of at least two people (an organization, association, society, or other group of individuals) who are both residing in an AgriCAL target area;

The following complaints will not be considered eligible:

- Matters not related to IFAD's actions or omissions in designing or implementing AgriCAL;
- Matters already considered by IFAD's Complaints Procedure, unless complainants have new evidence previously not available to them and unless the subsequent complaint can be readily consolidated with the earlier complaint;
- Submissions from foreign entities;

- Matters related to procurement of goods, services and consulting services;
- Accusations of fraudulent or corrupt activities in relation to project implementation – these are dealt with by IFAD's Office of Audit and Oversight.
- Matters that are frivolous, malicious, trivial, or generated to gain competitive advantage.

Allegations of sexual harassment, exploitation and abuse are dealt with through IFAD's existing policy to preventing and responding to sexual harassment, sexual exploitation and abuse, and are forwarded to IFAD's Ethics Office.

Retaliation

The key principle underlying IFAD's Complaint Mechanism is that every individual or group has the right to voice their criticism or file a complaint with relation to an IFAD-supported project without threats to their safety or fear of retaliation. IFAD expects its partners not to prevent or harm stakeholders who may (or have) criticised an IFAD-supported project or filed a complaint.

According to IFAD's Whistle Blower Protection Procedures, any retaliatory behaviour by IFAD personnel against an external party engaged in any dealings with IFAD because such person has reported unsatisfactory conduct and/or misconduct will be considered unsatisfactory conduct or misconduct.

During the project implementation process, IFAD will inform stakeholders of its SECAP principles, Adaptation Fund's Environmental and Social Policies as well as of the Complaints Procedures in force. To this end, IFAD will ensure that stakeholders are aware that they can contact IFAD directly and file a complaint if they believe that they are, or will be, adversely affected by AgriCAL and that the PMU is/are not responsive to their concerns.

Hence, complainants can go directly to level 3 and send their complaint to IFAD if they fear retaliation from the executing agency(ies).

Receipt and Registration of Complaint

After receipt of a complaint, the SECAP Redress Service (SRS) in IFAD will ensure that an acknowledgement of receipt is sent to the complainant(s) within five business days. Complaints submitted in another language than English, may require additional time for translation. The acknowledgement informs the complainant(s) the date by which IFAD will determine the eligibility of the complaint, and whether additional information is required.

Upon receipt, the SRS will verify whether the complaint is known and/or already being processed by the project-level grievance redress mechanism. If not, the SRS decides within 21 business days after the acknowledgement of receipt on the eligibility of the complaint, based on the criteria defined above. During this phase, further information may be requested from the complainant and/or the regional division to clarify the complaint. In case of partial or total ineligibility, the SRS will, if possible, advise the complainant on which alternative measures could be taken and/or to which institution the concerns may be addressed. In the case of full eligibility, the complainant will receive a notice with information on the next steps, and the complaint will be registered.

The SRS will also notify the following internal stakeholders regarding receipt of the complaint: the Country Director and other relevant staff including the Regional Director, Director Environmental, Climate, Gender and Social Inclusion Division (ECG), Director Sustainable Production, Markets

and Institutions Division (PMI), Director Operational Policy and Results Division (OPR), Office of the General Council (LEG), Communications Division (COM), Office of Enterprise risk Management (RMO) and others as appropriate.

Assessment of Complaint

Once a complaint is deemed eligible and registered as such, the SRS will initiate the assessment process. During this phase, the SRS will set up a review group consisting of the Country Director, ECG representative, PMI representative and a LEG representative to carry out an assessment of the complaint to:

- Develop a thorough understanding of the issues and concerns raised;
- Engage with the Project Delivery Team (PDT);
- Engage with the complainant, the grant recipient and the PMU;
- Identify local communities and additional stakeholders as relevant;
- Explain the different functions of the Procedure, their scope and possible outcomes to the parties involved; and
- Determine whether the parties seek to initiate a problem solving process or impartial review.

The assessment process is used to give the complainant(s), the grant recipient, and the PDT an opportunity to ask questions and consult with the SRS to facilitate informed decision making and understanding of the Procedure. Typical activities during this phase include:

- Review of project related documents;
- Meetings with the complainant(s), grant recipient, PMU staff, and if relevant local government officials, representatives of civil society and other stakeholders;
- Visit to the project site(s); and
- Public meetings in the project area as necessary.

When planning a visit, the SRS will inform all parties upfront of its planning.

At the end of this phase, the Complainant(s) and the grant recipient decide whether they would like to proceed with the problem solving process or an impartial compliance review. If both parties agree to the problem solving process, this will be started by the SRS. If there is no agreement, the complaint will be forwarded to the Impartial Review Function.

The assessment should be finalized within 120 business days after the registration of the complaint with an assessment report prepared by the SRS. The report should include:

- Summary of the information gathered and parties' perspectives of the issues raised;
- Decision of the parties to pursue a problem solving process or compliance review;
- Action plan with timeframe for implementation, including appointment of mediator as relevant;
- Copy of the complaint, anonymized as necessary, as well as any grant recipient's response that may be provided.

The report will be shared with all parties. Any comments should be received within 30 business days before the report is finalized and published (as necessary).

Problem Solving

If the parties agreed to a problem solving procedure, the SRS will facilitate the process to help resolve issues raised about the environmental and/or social impacts of the project through a neutral, collaborative, problem-solving approach. During the assessment phase, it should have been clarified what problem solving approach will be followed:

- **Facilitation and information sharing:** in case the complainant(s) raise(s) questions regarding existing or foreseen impacts of a project, the SRS may facilitate the involved parties to obtain the information and clarifications resulting in a resolution.
- **Mediation:** a neutral third party who acts as a mediator may be appointed to assist the parties involved in voluntarily negotiate a mutually satisfying resolution.
- **Fact-finding mission:** the SRS may contract (an) external consultant(s) to conduct a fact-finding mission to examine the issues agreed upon by the parties to reach a common understanding and possible solution.

Engagement in the problem solving process is in any case a voluntary decision and requires agreement between the complainant and the grant recipient. Each party reserves the right to exit at any point in the process.

Any agreement reached following the problem solving process should be specific in terms of objective, nature and requirements, and documented in written form (to be prepared by the SRS or involved mediator or consultant). The timeline for the process is to be defined in the assessment report, but in any case the process should not take longer than 2 years. In pursuit of a solution, IFAD will not knowingly support agreements that would coerce one or more parties, be contrary to IFAD or Adaptation Fund policies, or violate the domestic or international laws applicable.

Where an agreement is reached, the SRS will monitor the implementation of the agreement and share interim updates with the parties, IFAD management and on the website (as applicable).

Where there is no or only partial agreement reached, the SRS will verify whether the complainant(s) would like to transfer the case to the Impartial Review Function.

Impartial Review Function

In the case no or partial agreement is reached during the problem solving process, or if decided during the assessment phase, the SRS will forward the case upon agreement of the Complainant(s) to the Impartial Review Function, based in the Office of the President and Vice-President (OPV).

Out of a roster of independent experts, a minimum of two will be contracted to review the complaint and lead the impartial review. The role of these independent experts is to carry out reviews of compliance with IFAD's SECAP, Adaptation Fund's Environmental and Social Policy and other relevant policies, assess related harm and recommend remedial actions where appropriate. The

impartial review will consider issues raised in the complaint or identified during the assessment process, but not those already resolved during the problem solving process.

The Impartial Review should be finalized within a reasonable timeframe, no later than 2 years. The number of days to finish the review will depend on the complexity of the case (i.e. need for field visit, number of stakeholders involved), as well as the findings and conclusions of the review.

After completion, the independent experts will prepare a final report of their findings and in the case of non-compliance, specific actions to undertake. The report may also contain recommendations for IFAD on how to improve existing policies and/or procedures. After receiving internal comments, the (revised) draft report will be sent to the complainant(s) and the grant recipient for fact checking. Comments should be received within 15 business days. The final report will then be prepared for disclosure to IFAD management and the Executive Board within 10 business days. IFAD management will provide a management response to the final report within 10 business days. The final report including the management response will be sent to the complainant(s) and a summary will be published at IFAD's website.

In cases where non-compliances are identified, the SECAP Redress Service will monitor the situation until actions are taken to assure non-compliance(s) are addressed.

Reporting and Information Disclosure

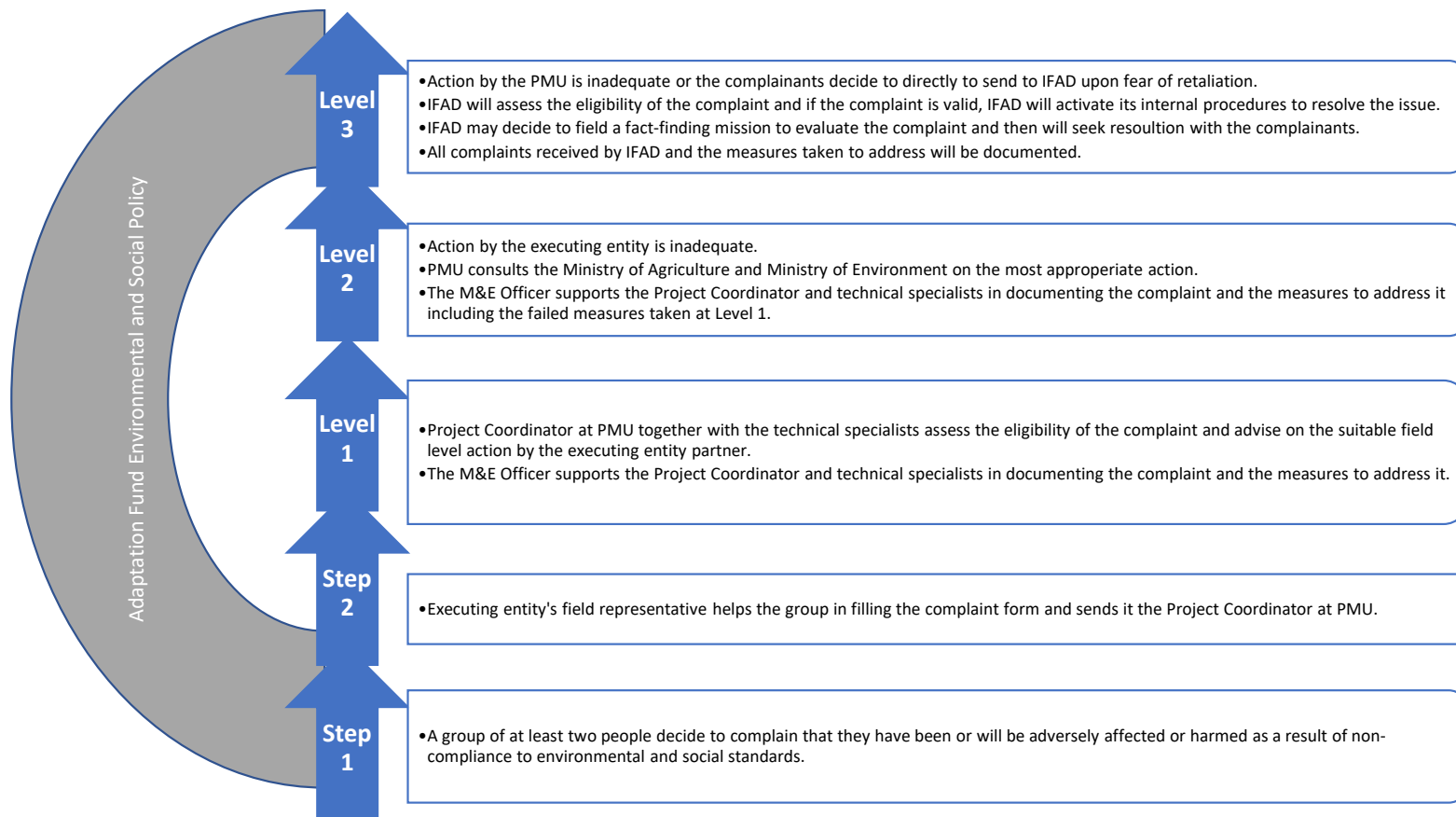
All information relevant to the case, including updates on the status and progress of the complaint process, to the extent possible and consistent with IFAD's disclosure policy, is shared with the complainant(s). In addition, IFAD will publish a case registry on its website. The registry will contain the following information in relation to eligible complaints:

- A brief summary of the issues raised
- Date of receipt
- Date of registration
- Project details (name, number, E&S category & climate classification, implementing partner, country, status)
- Information on the status
- Link to available report(s)
- The case registry will also contain information in relation to ineligible complaints, namely:
 - Key issues raised
 - Date of receipt
 - Project details as above
 - Basis for ineligibility

Once a case is closed, IFAD will prepare a summary of the complaint, including follow-up actions and recommendations, taking into account privacy and confidentiality regulations and IFAD's disclosure policy, to be published on its public website. The summary will also be included in IFAD's Annual Report which is published on its website.

Resolution

Upon acceptance of a solution by the complainer, a document with the agreement should be signed.



Annex 3: Updated Gender analysis and Gender matrix.

The forthcoming document presents a short literature review of the gender situation in Lebanon to complement the gender analysis as done during the AgriCal project design. Based on this, a gender matrix has been developed that summarizes the main action areas of AgriCal in terms of gender empowerment and women's equality.

Lebanon ratified the Convention on the Elimination all Forms of Discrimination Against Women (CEDAW) in 1996 and in the late 1990s, Lebanon adopted gender mainstreaming in the collection and analysis of gender statistics. In spite of solid achievements with regard to equality and empowerment in recent years, women in Lebanon still face inequality in society, politics, legal affairs and the labour market especially in rural areas. Lebanon's 2020 gender inequality index stands at 0.411 with a significant difference between the HDI for men (0.774) and women (0.691). Nonetheless, Lebanon ranked 132nd out of 144 countries in the world and 6th among Arab countries on the global gender gap index of the World Economic Forum³⁸. In terms of political participation, women occupy only 4.7 per cent of seats in the Lebanese parliament³⁹.

Although Illiteracy rates among adult women stood at 12 per cent in 2009⁴⁰, this number is higher in rural areas. In fact, as noted by the project design document, female illiteracy reaches 24,5% in the project areas. ILO estimated the unemployment rate among the female labour force was 9.8 per cent in 2018 which is double male's unemployment estimated at 4.9 per cent. Higher unemployment rates among women compared to men were also noted in the Agrical design document. Based on analysis from UNWOMEN, an estimated 25 per cent contraction in real GDP from 2017 to 2020 is expected to have increased the women's unemployment rate from 14.3 per cent before the crisis to 26 per cent by September 2020. This translates to an increase from 81,200 unemployed women to 132,500 unemployed women. However, these projections are likely conservative lower bound estimates of the true effect of the economic contraction on employment in general. Also, due to the economic downturn, UNWOMEN is expecting that a high percentage of women are exiting the labour force completely. UNWOMEN calculated them to be almost 40,000 strong by October 2020. However, there seem to be labour market dynamics at play at the household-level—that could actually lead to women becoming the main breadwinner and enter the job the job market. This is for example the case when the main breadwinner loses his job. When women enter the job market, they will often be forced into informality precarious, hazardous or part-time work. UNWOMEN calculated that there is an average of 7.1 per cent increase in the rate of informality in female labour. UNWOMEN expects that many are employed in the agricultural sector⁴¹.

Limited sex-disaggregated statistics and the lack of gender analysis in the sector inhibits exact calculations of the percentage of women that are active in the agricultural sectors. Yet, it is widely accepted that women in rural areas are major contributors to this sector and could account up to 43 per cent of the agricultural work force. An FAO agricultural census revealed that the average agricultural holder's age was 52-years-old, while for women holders the average was 55-years-old. Almost 30 percent of the women agricultural holders were above 65 years of age, compared to 23 percent for men.

Women usually spend long hours performing labour-intensive and time-consuming manual agricultural tasks, such as sowing, weeding, harvesting and processing. They are also responsible for a major part of livestock production as well as processing activities. Some estimates indicate that in certain labour-intensive agricultural sectors (e.g. tobacco growing) and household-based production activities, women actually constitute the absolute majority. Available data and studies suggest that women involved in agriculture are less likely than men to own land and are generally involved in smaller-scale agricultural work. According to the Lebanese constitution women (both married and unmarried) have the same rights as men when it comes about entering into contracts and owning & administering property (including land and non-land assets). In practice, however, husbands and male family members often heavily influence women with regard to the administration of property, income and other financial assets. Moreover, a predominant belief is that family property including land should be kept

³⁸ UNDP, UNFPA and UN Women (2018). Gender-Related Laws, Policies and Practices in Lebanon.

³⁹ World Bank (2019). Data Portal [<https://data.worldbank.org/country/lebanon>].

⁴⁰ Latest available statistics found.

⁴¹ UNWOMEN (2020), Women at the verge of the economic breakdown.

within the same family and thus should be registered under a male's name, even if it contradicts inheritance calculations or assigned shares sanctioned under a given religion. In addition, women have less access to productive inputs, finance, technologies and markets.

Cooperatives are present in rural areas of Lebanon. Officially, there exist a total of 1 350 cooperatives, including 1 086 agricultural cooperatives. Additionally there are around 12 federated agricultural cooperatives in Lebanon. The official numbers, however, often do not correspond to the produce offered by cooperatives and it is likely that their number is much higher in reality. Cooperatives in Lebanon are male-dominated; women's cooperatives make up 10 percent of total cooperatives and 19 percent of agricultural cooperatives. The majority of women's cooperatives are women-led agro-food cooperatives (livestock, produce, beekeeping, fisheries, crafts and other artisanal goods). That is, rural women mostly organize themselves and assume leadership positions in agro-processing and marketing and rural artisanal produce organizations⁴².

There is significant gap in Lebanon in terms of educational achievements between public and private education, with pupils being enrolled in private education significantly outperforming pupils in public education. Due to the crisis, there overall number of girls being enrolled in public education amounted to a 15 per cent increase overnight. With a feminine skew in public schooling (as opposed to private school) already in place before the crisis, more girls will now be deprived of the opportunity to attend better quality schools. Also, there are reports of significantly higher rates of violence and harassment in public schools than in private schools. Many female youth, especially in periphery and rural areas, do not enter the labour force or exit very early and become economically inactive. The average age of marriage has moved back considerably for both males (29 to 32) and females (23 to 27.7) since 1970, though there remains a small subset of female youth (6 per cent) who were married before the age of 18⁴³.

Although comprising less than 5 per cent of the country's GDP, the Lebanese IT sector is growing fast and is well-known in the region. Consequently, many international donors started with rolling out projects in order to employ women in the IT sector. With 81.6 per cent mobile subscriptions (2016), Lebanon is considered a laggard country in terms of internet access. The low subscription rate is due to the high costs for mobile usages. Mobile coverage among women is suspected to be lower than men⁴⁴.

Overall, among the recommendation provided by UNWOMEN to decrease the impact of the crisis on women is to (i) structurally address inequalities, (ii) design social policies to address gender inequalities, (iii) make fundamental changes to the care economy. One of the concrete measures under designing social policies is to provide affordable mobile technologies and internet services.

AgriCAL Gender Matrix		
1.	The project proposal contains – and project implementation is based on – gender disaggregated poverty data and an analysis of gender differences in the activities or sectors concerned, as well as an analysis of each project activity from the gender perspective to address any unintentional barriers to women's participation.	Project design includes an in-depth analysis on the situation of women in Lebanon. The current document updates existing information gaps in the analysis and further aligns it with realities on the ground. Exact number of households benefitting from AgriCAL has been gathered by the project management unit for component one and component three (including female beneficiaries).
2.	The project proposal articulates – or the project implements – actions with aim to expand women's economic empowerment	AgriCAL seeks to economically empower women by the distribution of aromatic plants for female beneficiaries under component three. Agricultural risk

⁴² FAO (2021), Role of women in agriculture Lebanon.

⁴⁴ Media landscapes (2021) - Lebanon country profile.

	through access to and control over productive and household assets	mitigation is offered through component two which when followed accordingly should increase the economic viability of a farm. Component one will improve the irrigation networks of farms which could decrease their running costs and thus increase profit. By ensuring the inclusion of women in small-scale institutions, their bargaining power and overall voice should increase.
3.	The project proposal includes one paragraph in the targeting section that explains what the project will deliver from a gender perspective.	Yes, this was included in the original design and has been implemented accordingly.
4.	The project proposal describes the key elements for operationalizing the gender strategy, with respect to the relevant project components.	Yes, this was included in the original design and has been rolled out accordingly. For example, the beneficiaries for the hill lakes have been identified by the IFAD funded HASAD project. However, social economic studies have been conducted to identify the number of women in the project area. Also, a participatory approach has been developed specifically looked into issues faced by women in order to operationalize them during the implementation phase.
5.	The design document describes - and the project implements - operational measures to ensure gender- equitable participation in, and benefit from, project activities. These will generally include:	
5.1	Allocating adequate human and financial resources to implement the gender strategy	The implementation of gender activities has been equally divided among all members of the PMU to assure that the activities are adequately mainstreamed. Budgets to implement gender activities have been mainstreamed in the overall budgets as well with the exception of the distribution of medicinal plants.
5.2	Ensuring and supporting women's active participation in project-related activities, decision- making bodies and committees, including setting specific targets for participation	AgriCal uses small scale institutions, who commonly are part of municipalities in order to manage the water streams from the hill lakes. Some 30% of the households benefitting from the hill lakes should be female.
5.3	Ensuring that project/programme management arrangements (composition of the project management unit/programme coordination unit, project terms of reference for staff and implementing partners, etc.) reflect attention to gender equality and women's empowerment concerns	The Project Management Unit does not have a gender focal point. However, the the majority of implementing staff received training on gender related issues.
5.4	Ensuring direct project/programme outreach to women (for example through appropriate numbers and qualification of	As per project design, 30% of the total beneficiaries should be women. The vast majority of these will be targeted under

	field staff), especially where women's mobility is limited	the early warning system rolled out under component 2. Gender sensitive messaging will be assured to make sure that women will receive the messages provided under component 2.
5.5	Identifying opportunities to support strategic partnerships with government and others development organizations for networking and policy dialogue	UNWOMEN is currently rolling out the productive sector development programme aimed at improving the role of women in the agricultural sector. The first component of this project aims at policy engagement in the agricultural sector and lessons learnt from Agrical can be shared with UNWOMEN in this regards.
6	The project's logical framework, M&E, MIS and learning systems specify in design – and project M&E unit collects, analyses and interprets sex- and agedisaggregated performance and impact data, including specific indicators on gender equality and women's empowerment.	The logical framework contains gender disaggregated targets. The project Management Information System (MIS) and M&E framework will collect sex- and age-disaggregated performance data. This will be analysed and interpreted and reviewed on a regular basis in order to course correct if and where needed.

Annex 4: Disbursement Plan


Copy of Agrical
Disbursement Plan 1

