ADAPTATION FUND

AFB/PPRC.30/53
4 October 2022

Adaptation Fund Board
Project and Programme Review Committee

Agenda item 12

REQUEST FOR CHANGES: DELETION OF OUTPUT, MATERIAL CHANGE AND CHANGE IN PROJECT OUTPUTS' INDICATORS TARGETS: UN-HABITAT (JORDAN, LEBANON)

Background

1. The Adaptation Fund Board (the Board) at its thirty-fifth/thirty-sixth meeting, approved the project titled “Increasing the Resilience of both Displaced Persons and Host Communities to Climate Change-Related Water Challenges in Jordan and Lebanon”, submitted by the United Nations Human Settlements Programme (UN-Habitat) for a requested amount of US$ 13,973,509 (decision B.35-36/21).

2. The objective of the project is to better respond to climate change impacts and vulnerabilities in the context of the Syrian crisis in Jordan and Lebanon by demonstrating concrete adaptation measures that respond to the needs of both Displaced Persons (DPs) and host communities.

3. The project includes four main components: (i) Manage urban risks and vulnerabilities in the context of climate change, especially water scarcity challenges, and urban (population) growth, including from DPs migration; (ii) Improve awareness, ownership and capacities to respond to climate change, incl, to operate, maintain and replicate resilient water harvesting, supply and irrigation systems; (iii) Expand unconventional water harvesting and supply options, using innovative and replicable techniques; (iv) Improving knowledge and policies and regulations to increase urban resilience in the region.

4. As mandated by the aforementioned decision, an agreement was prepared and signed between the Board and UN-Habitat in July 2021. The first tranche of disbursement for the implementation of the project was released following the signature of the agreement.

5. The project inception report for the project was submitted in November 2021. As of September 2022, a total amount of US$ 2,660,482 had been disbursed to the project by the Trustee.

6. While reviewing the project inception report in December 2021, the secretariat noticed a few changes made to the original project proposal (change in executing entities, provision of direct project services and revision of outputs indicators targets). The secretariat shared relevant provisions of the Fund’s Operational Policies and Guidelines and its annexes with the UN-Habitat and requested it to submit the request for changes alongside relevant documents. The secretariat carried out a full technical review of the revised fully-developed project proposal, and submitted the request for change (AFB/PPRC.29-30/3) to the PPRC, which was subsequently approved by the Board (Decision B.38-39/3) in May 2022.

7. On 8th June 2022, UN-Habitat sought advice from the secretariat on a request for change in project outputs’ indicators targets, deletion of output and material change. This request originates from the outcomes of feasibility assessments undertook by UNICEF and that were originally intended to be done by other executing entities (Lebanese Agricultural Research Institute and the Bekaa Water Establishment). Such assessments entailed public consultations and field assessments of targeted infrastructures and areas. These assessments highlighted a few issues related to inflation-fueled increased in equipment prices, changing food security-related needs on the ground, and updated baseline information on the use of drip irrigation. Ultimately, this led UN-Habitat to request the following changes:

(i) *Deletion of output 3.6 (Water-use-efficient irrigation of treated wastewater for fruit trees and vineyards in Lebanon from Zahle wastewater treatment*

plant) and associated material change: this is motivated by the increased use of drip irrigation in the target area since 2018 resulting from national level promotion of water efficient irrigation techniques. Associated training and capacity building activities planned under outputs 2.4 and 2.6 would be maintained. This will allow re-allocating US$ 988,950 to output 3.4 (Efficient treatment and reuse of wastewater from Zahle wastewater treatment plant), thus increasing the area irrigated with treated wastewater from 150 to 800 hectares. This will support an increasing number of vulnerable individuals engaging in local farming because of the unprecedent financial crisis that has crippled the country since 2019 which drove 82% of the total population (including refugees) below the poverty line, including 40% below extreme poverty.

(ii) *Revision of the original targets for outputs indicators:* output 3.4 (Efficient treatment and reuse of wastewater from Zahle WWTP, in Lebanon) from 150 to 800 hectares and from 18,000 m^3 to 20,000 m^3, output 3.2 (Rooftop rainwater harvesting in Jordan) changed from 86 to 64 and number of beneficiaries decreased by 20%, output 3.5.1 (Efficient treatment and reuse of wastewater in Jordan) changed from 3,000 m^3 to 2,000 m^3, output 3.5.2 (Rooftop rainwater harvesting in Jordan) from 2,000 m^3 to 500 m^3, output 3.7.2 (Water-use Efficient irrigation of treated wastewater from Mafraq WWTP, Jordan. Modern irrigation system) from 100 to 75 dunums and from 15 to 8 storage pounds, output 3.1 (Rooftop rainwater harvesting in Lebanon) from 20 to 10 systems at educational facilities and 1,410 m^3 to 245 m^3, output 2.7.2 changed from 300 to 290 direct beneficiaries and 1,661 to 1,740 municipalities, output 2.1 from 55,000 to 58,912 beneficiaries and output 2.2. from 52,855 to 42,284 beneficiaries.

8. 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 (UN-Habitat), including the following:

"6. A material change is defined by the Board (decision B.29/31) 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".

7. Implementing entities wishing to submit a request for a material change shall do so through the secretariat prior to the implementation of the change described in the request. Such requests for a material change should include at least:

- *a revised budget at output-level with comparison to the original,*
- *a revised results framework with comparison to the original,*
- *a written clarification on the material change itself and the reasons for the material change, and*
- *a letter from the designated authority endorsing the material change.*

8. Lastly, the existing caps on an implementing entity's fees and execution costs shall apply and shall not be exceeded due to budget changes."

[…]

"10. For changes in project outputs, including introductions, modifications and deletions, the implementing entities should:

(i) obtain prior approval from the Board;
(ii) communicate such changes to the secretariat; and
(iii) submit a letter from the designated authority endorsing such changes to the secretariat, in order to obtain such approval.

[…]

"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".

9. It subsequently requested the Implementing Entity (UN-Habitat) to submit the request for changes alongside relevant documents, including letters from designated authorities, which UN-Habitat submitted on August 10th, 2022.

10. 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 UN-Habitat and offered it the opportunity to provide responses before the review sheet was sent to the PPRC.

11. The secretariat is submitting to the PPRC the summary and, pursuant to decision B.17/15, the final technical review of the project, both prepared by the secretariat, along with the final submission of the proposal in the following section. In accordance with decision B.25.15, the proposal is submitted with changes between the initial submission and the revised version highlighted.

Secretariat's review of the request

12. Following a review of the request as described in UN-Habitat letters to the Adaptation Fund Board and the revised fully-developed project document presented as annex 5, the secretariat is of the view that the request for: i) deletion of output; ii) material change and iii) changing original targets for outputs indicators is reasonable, given the specific context of the project.

13. Indeed, a rapidly evolving financial, economic and social crisis in Lebanon has resulted in shifting priorities on the ground and increasing food security threats. Global inflation has also jeopardized both target countries and the project ability to work within the budget originally approved by the Board. The proposed risk mitigation measures would allow emphasizing

activities to the most pressing needs faced by communities vulnerable to climate change on the ground (i.e., supporting food security through irrigation with reused of wastewater), and to adjust the project targets before the submission of the first project performance report, as guided by the Annex 7 of the OPG. Such revisions of targets are requested under exceptional circumstances, because of inflation-fueled increased in equipment prices, as highlighted in the letters from the Designated Authority for Jordan (annex 1) and Lebanon (annex 2). Such changes do not significantly alter the ultimate objective and scope of the project and are deemed reasonable by the secretariat.

14. In line with the relevant provisions set forth in the OPG, an initial technical review of the revised fully-developed proposal was conducted by the secretariat considering all proposed changes. A few clarification requests (CRs) and corrective action requests (CARs) were raised as detailed in the review sheet which was shared with UN-Habitat. The final technical review (annex 4) finds that UN-Habitat had adequately addressed all the issues raised.

Recommendation

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

a) Approve the request for change in deletion of output, material change and change in project outputs' indicators targets for the project "Increasing the Resilience of both Displaced Persons and Host Communities to Climate Change-Related Water Challenges in Jordan and Lebanon", as requested by the United Nations Human Settlements Programme (UN-Habitat) and as contained in the revised project proposal presented as Annex 5 of document AFB/PPRC.30/53;

b) Request the secretariat to draft an amendment to the agreement between the Board and UN-Habitat to reflect changes made under subparagraph a).

Annexes

Annex 1: Letter by the Designated Authority for Jordan endorsing the proposed changes
Annex 2: Letter by the Designated Authority for Lebanon endorsing the proposed changes
Annex 3: Letters from the Implementing Entity requesting the project changes
Annex 4: Project technical review undertaken by the AFB Secretariat and shared with UN-Habitat
Annex 5: Revised proposal document with tracked changes addressing comments made by the secretariat in its initial review

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

Ministry of Environment

Ref.No 7/2/7453
Date 17/8/2022

To: The Adaptation Fund Board
C/O Adaptation Fund Board Secretariat
Email: Secretariat@Adaptation-Fund.org
Fax: 202 522 3240/5

Subject: Request to approve the amended project's activities and budgets of some outputs

Reference is made to the enclosed revised "Increasing the resilience of both displaced persons and host communities to climate change-related water challenges in Jordan and Lebanon" project's proposal.

Please note that when the Executing Entities in Jordan started the first phase of implementation of the project's outputs and activities and conducted initial on-ground assessments of current situation of targeted execution sites and beneficiary communities, they have found out that in light of the unprecedent post-COVID 19 increase in the prices of some materials, equipment needed to implement the activities, and fright and customs prices worldwide and domestically, the EEs had to do some reduction of quantities of some targets of the original indicators of some of the outputs, as follows:

EE: JOHUD

Output 3.2. Rooftop rainwater harvesting in Jordan

1. Decrease rainwater harvesting system from 86 to 64
2. Decreased number of beneficiaries by 20%

EE: MWI/YWC

Output 3.5.1: Efficient treatment & reuse of wastewater in Jordan: Improving water quality and storage capacity for irrigation use from Maerad WWTP

1. Decrease water storage capacity from 3000 m^3 to 2,000 m^3

Output 3.5.2 Efficient treatment and reuse of wastewater in Jordan: Improving water quality and storage capacity for irrigation use from Al Akaider WWTP

1. Decrease water storage capacity from 2000 m^3 to 500 m^3

The Hashemite Kingdom Of Jordan
Tel : +962 6 5560113 Fax : +962 6 5516377 P.O.Box : 1408 Amman 11941 Jordan www.moenv.gov.jo

Ministry of Environment

Ref.No 7/2/17453
Date 17/8/2022

EE: BADIA FUND

Output 3.7.2 Water-use Efficient irrigation of treated wastewater from Mafraq WWTP, Jordan. Modern irrigation system

1. Decrease irrigated area from 100 to 75 donums
1. Decrease water storage ponds from 15 to 8

EE: PRI (in collaboration with Local University/Research Centre, the main beneficiary)

Output 2.8
Output 3.8

1. Based on extensive discussions and assessments that took place between PRI and potential local universities/research centres, it was mutually decided that the sets of pre-inception activities suggested in the original proposal set forth by PRI's team were more suitable to the capabilities of the potential local universities/research centres to partner with. This would ensure that the outcome of this output will adhere to the project's goals and objectives. Please note that the enclosed sets of activities and targets are approved by the MoEnv.

Considering the above-mentioned justification for amendment, we would like to confirm that the NDA reviewed the above changes in the revised version of the project document and approved them. Please note that all changes made will not affect the sub-budgets allocated for each EE nor the overall budget of the project, which remains the same as in the original project document.

Finally, Ministry of Environment and our partner UN-Habitat recognize and commend the Adaptation Fund Board for their continuous understanding and support to our adaptation program in Jordan.

Best Regards,

Minister of Environment

Dr. Muawieh Khalid Radaideh

THE HASHEMITE KINGDOM OF JORDAN
TEL : +962 6 5560113 FAX : +962 6 5516377 P.O.BOX : 1408 AMMAN 11941 JORDAN www.moenv.gov.jo

PRI-Local University/Research Centre final set of activities -July 2022

Outputs	Activities		Budget notes	Total	Year	Year	Year	Year
				USD	1	2	3	4
Output 2.8. Community organisation, awareness and capacity building + operation, maintenance and replication and upscaling plans for concrete adaptation output 3.8; permaculture demonstration	Phase 1: assessment	Detailed technical studies for systems integration (plant, animal, water, energy, soil and human) (PRI)	Permaculture systems advisor (international)	24400	24,400	-	-	-
	Phase 2: plan	Detailed technical design for systems integration (plant, animal, water, energy, soil and human) (PRI)	Permaculture systems advisor (international)	24400	24,400	-	-	-
	Phase 4: O & M	Awareness raising and capacity building to operatate and maintain project activities (PRI)	Workshops to involve surrounding communities (site visits and deisgn and operation training)	10,000	3,000	3,000	2,000	2,000
			Operation & maintenance plan	2,000	-	2,000	-	-
			Online Permaculture Design Certificate Course (28 modules, released weekly + final design exercise at Local University's land or land owned by local community members. Cost per student	170,000	42,500	42,500	42,500	42,500
	Phase 5: Replicate + Scale-up	Awareness raising and capacity building to repicate and scale-up project activities (PRI)	Workshops to involve surrounding communities (site visits and replication training)	4,000	-	-	2,000	2,000

Outputs	Activities		Budget notes	Total	Year	Year	Year	Year
				USD	1	2	3	4
			Replication / upscaling plan and guidelines, incl. permaculture landscape design plan for surrounding communities	5,000	-	-	-	5,000
	Technical support and coordination	Sub-project Coordination (PRI)	Sub-project coordination / strategic advisor (internat) (100 %)	48,800	12,200	12,200	12,200	12,200
			Technical support to execute activities (100 %)	20,000	5,000	5,000	5,000	5,000
			Logistics, admin and accountancy (100 %)	6,000	1,500	1,500	1,500	1,500
Sub-total				**314,600**	**113,000**	**66,200**	**65,200**	**70,200**

Outputs	Activities		Budget notes	Total (USD)	Year 1	Year 2	Year 3	Year 4
Output 3.8. Permaculture demonstration - closed loop water system in Jordan	Phase 3: Implement (concrete measures)	Bio-Fertilizer production	Compost turner	22000JD = 31,030USD	31,030	-	-	-
			Tractor Massey Ferguson	23000JD = 32,445USD	32,445	-	-	-
			Woodchipper	5,000	5,000	-	-	-
			Compost tea brewer 20 litres (Sunsun Airblower 350Lpm) (incl soil testing kit)	590AUD = 405USD	405	-	-	-
			Microscope (Optico ZSX-107T Soil Biology Microscope) **(Bundle with camera, adapter and soil test kit.)**	2,000 USD	2000	-	-	-
			ReoTemp compost Thermomenter (HD) with handle	300AUD = 205USD	205	-	-	-
			Mulch bales/ 10M3 a month of compost 120 bales a month x 12 month = 1440 bales = JD 5760	5000	1250	1250	1250	1250
			Manure (truck load) every truck of mulch need truck off manure 2 truck a month 24 a year 96 for 4 years = 768 truck = 9600JD	8,000	2,000	2,000	2,000	2,000
			Diesel average per litre	880	160	240	240	240
		Crop Garden and Compost Egg laying Chickens	Poly tunnels	9450	9,450	-	-	-
			Irrigation	550	550	-	-	-
			Chickens 30 chickens = 10JD each = 300JD x 2	850	425	-	-	-

Outputs	Activities		Budget notes	Total (USD)	Year 1	Year 2	Year 3	Year 4
			(exchange after 2 years) = 600JD Fencing	 1000	 1000			
			Feed for 30 chickens 10JD per chicken =30 chicken = 300JD for 4 years 1200JD	1695USD	423	423	423	426
			Hand tools, 2 wheelbarrows, 2 rakes, 2 shovels, 2 hoes, 2 pruners, 2 loppers, 2 pruning saws, 2 pitch forks Seeds and Seedslings	300 720	300 180	- 180	- 180	- 180
						-	-	-
		Compost worms: vermicompost	3 bath-tub worm farms	300	300	-	-	-
		Olive Orchard Monoculture Conversion to Food Forest (1,000m2)	Irrigation	550	550	-	-	-
						-	-	-
			Trees	720	180	180	180	180
			Seeds	300	75	75	75	75
	Technical support	Supervisision Permeculture demonstration site installation and maintenance	Permaculture expert (National)	120,000	48,000	24,000	24,000	24,000
			Agriculture laborer (National)	57,600	14,400	14,400	14,400	14,400
			Strategic advise / expert (International)	40,000	22,000	6,000	6,000	6,000
			Permaculture systems advisor (international)	40,000	22,000	6,000	6,000	6,000

Outputs	Activities		Budget notes	Total (USD)	Year 1	Year 2	Year 3	Year 4
			Overhead/Research (Local University)	25,046	6,263	6,261	6,261	6,261
Sub-total				**384,046**	**200,591**	**61,009**	**61,434**	**61,012**

TOTAL BUDGET FOR OUTPUTS:

Outputs	TOTAL (USD)	Year 1	Year 2	Year 3	Year 4
Output 2.8. Community organisation, awareness and capacity building + operation, maintenance and replication and upscaling plans for concrete adaptation **total**	**314,600**	**113,000**	**66,200**	**65,200**	**70,200**
Output 3.8. Permaculture demonstration - closed loop water system in Jordan **total**	**384'046**	**200,591**	**61,009**	**61,434**	**61,012**
TOTAL	**698,646**	**313,591**	**127,209**	**126,634**	**131,212**

Annex 2: Letter by the Designated Authority for Lebanon endorsing the proposed changes

REPUBLIC OF LEBANON
MINISTRY OF ENVIRONMENT

Beirut, 10/8/2022
Our Ref.: 1920/B

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

Subject: Request of increase of area proposed to be irrigated with treated wastewater

Reference is made to the United Nations Framework Convention on Climate Change (UNFCCC) Adaptation Fund project "Increasing the resilience of both displaced persons and host communities to climate change-related water challenges in Jordan and Lebanon" with reference number AF00000166 – led by UN-Habitat.

Due to the financial crisis that has crippled Lebanon since 2019, significantly increasing poverty rates of both displaced persons in Lebanon and host communities, and jeopardizing food security of vulnerable Lebanese and displaced persons, the development of the agricultural sector has been identified as a major adaptation method to the rising food security problem.

As a result, the Ministry of Environment requests to amend the design of the Project by increasing the area proposed to be targeted by irrigation with treated wastewater from 150 to 800 hectares. The resulting changes in project Outputs 3.1, 3.4 and 3.6 have been reviewed by and are deemed acceptable to the Ministry of Environment.

Therefore, in my capacity as the National Designated Authority for the Adaptation Fund in Lebanon, I hereby request to partially use some of the budgets originally allocated to rainwater harvesting and drip irrigation activities to cover the additional cost required for the amended design of the treated wastewater conveying system. This will contribute to alleviating the current and imminent food crises, noting that the produce and crops cultivated in the target area are not only used locally but also throughout the whole of Lebanon.

Sincerely,

Republic of Lebanon
Ministry of Environment

Minister of Environment
Nasser Yassine, PhD

Ministry of Environment, Lazarieh Center, 7th Floor, Block A-4 Old
P.O.Box: 11/2727; Beirut-Lebanon. Tel: +(961)-1-976555 or 4-Digit Number: 1789; Fax: +(961)-1-976530
Home Page: www.moe.gov.lb

Annex 3: Letters from the Implementing Entity requesting the project changes

Regional Office for Arab States (ROAS)
87 Tahrir st, Dokkie, Giza, Egypt
Telephone: +2(02) 37618812, Fax: +2(02) 37618813
unhabitat-ROASinfo@un.org, www.unhabitat.org

Cairo, 10 August 2022

The Adaptation Fund Board
c/o Adaptation Fund Board Secretariat
E-mail: secretariat@adaptation-fund.org
Fax: +1 202 522 3240 / 5

To Whom It May Concern:

Reference is made to the United Nations Framework Convention on Climate Change (UNFCCC) Adaptation Fund funded project, entitled: "*Increasing the resilience of both displaced persons and host communities to climate change-related water challenges in Jordan and Lebanon*" with reference number AF00000166.

Reference is further made to:

(1) The first amendment request submitted on 22 February 2022 and approved by the Adaptation Fund on 14 June 2022, which resulted in changing some original targets for output indicators, changing executing entities and requesting direct project services.

(2) The enclosed letters from the national designated authorities of Lebanon and Jordan, dated 10 August 2022 and 4 August 2022 respectively, on the need for the revision of project outputs 3.1, 3.4 and 3.6 in Lebanon, and project outputs 2.8, 3.2., 3.5.1, 3.5.2, 3.7.2, and 3.8 in Jordan, based on the significant contextual changes in both countries and worldwide since 2019 (further elaborated below).

(3) The detailed assessment which took place in June and July 2022, concerning components 2 and 3 of the project in Lebanon and Jordan which entailed public consultations and detailed field assessment of targeted buildings and Project areas.

(4) The global inflation of prices of materials since 2018, when the project was initially conceived and feasibility undertaken, translating to the current supply and cost, impacting this project. Examples being the price of steel rebar which has increased from US$ 700 to approximately US$ 1,000 per metric ton, between 2019 and present and the domestic and global increases in freight and custom prices.

Based on the above, UN-Habitat is hereby proposing the following amendments:

For Lebanon:

An unprecedented financial crisis has crippled Lebanon since 2019 driving 82% of the total population (including refugees) below poverty line, of which 40% are below extreme poverty.[1] In this context, a significant trend of local farming has transpired, as a primary means for self-sustenance, and food security. It is therefore proposed to increase **under Output 3.4** the area irrigated with treated wastewater from 150 to 800 hectares to support vulnerable farmers increasingly engaging in the agricultural sector. This will require the amendment of the initially proposed concept design for the treated wastewater conveying system as described in the amended project document and budget accompanying the current letter.

[1] UNESCWA (2021). Multidimensional poverty in Lebanon (2019-2021). E/ESCWA/CL3.SEP/2021/POLICY BRIEF.2

While the amended solution simplifies the legal permitting process and is highly desired by the local authorities and stakeholders, as voiced during additional consultations implemented during the aforementioned detailed assessment, it implies a larger budget of US$ 2,246,556 versus an originally allocated budget of US$ 846,120. The balance of the needed budget is proposed to be supplied through:

(1) Limiting **under Output 3.1** the buildings targeted by rainwater harvesting to 10 educational facilities where space is available for the installation of tanks, water demand is high, and shortages are common during the dry period based on the assessment findings. This will reduce the budget allocated for this output from US$ 867,262 to US$ 460,776, and;

(2) Eliminating **under Output 3.6** the installation of drip irrigation networks and associated automation and water saving devices. This is based on the increase in the use of drip irrigation in the target area since 2018, resulting from the promotion of water efficient irrigation techniques at the national level, particularly in the context of the current ongoing and protracted socio-economic crises in Lebanon. It is proposed however, to keep the associated training and capacity building activities planned under **Outputs 2.4 and 2.6**. This will allow the re-allocation of US$ 988,950 to the budget of **Output 3.4**.

Additional changes primarily related to the amendments discussed in this cover letter are also introduced in track changes and/or highlighted in the amended project document and budget for your consideration.

For Jordan:

Based on the results of the first phase of implementing the project's outputs and activities in Jordan and on-ground assessments of targeted Project execution sites and beneficiary communities, the executing entities highlighted that as a result of COVID-19, there have been unprecedented changes in the global supply chain, which has resulted in a significant increase in prices of freight charges and material and equipment needed to realize their outputs. For example, for output 3.2, after conducting their latest assessment and re-pricing material and equipment required to install rainwater harvesting systems, it was concluded that for each system they need to establish, which includes tanks, pumps, and surface rehabilitation, the prices have increased by 30%, reaching US$ 10,648 per system. Hence, the executing entity adjusted the number of systems to install, considering the initial number of targeted beneficiaries, and trying to align as much as possible. The need to adjust other interventions due to cost increase is applicable to the majority of other executing entities. Based on the above, the following amendments are requested.

(1) Output 3.2: Rooftop rainwater harvesting

After re-pricing the required materials to implement this output, it is clear that the previously allocated budget will not suffice to cover the initially proposed number of rainwater harvesting systems. Consequently, the requested changes are as follows:

a. Decrease rainwater harvesting systems from 86 to 64.
b. Resulting in a decreased number of beneficiaries by 20%.

(2) **Outputs 3.5.1 and 3.5.2: Efficient treatment & reuse of wastewater in Jordan**

After consultation with the Yarmouk Water Company, who is responsible for outputs 3.5.1 and 3.5.2 below, and after reviewing the current condition of their facilities, they suggested the changes below. In addition to the changes below, some minor changes to those outputs were proposed and are reflected in the project document in track changes.

Output 3.5.1. Efficient treatment & reuse of wastewater in Jordan: Improving water quality and storage capacity for irrigation use from Maerad waste-water treatment plant (WWTP)

a. Decrease water storage capacity from 3,000m^3 to 2,000m^3

Output 3.5.2. Efficient treatment and reuse of wastewater in Jordan: Improving water quality and storage capacity for irrigation use from Al Akaider WWTP

b. Decrease water storage capacity from 2,000m^3 to 500m^3

(3) Output 3.7.2 Water-use efficient irrigation of treated wastewater from Mafraq WWTP, Jordan. Modern irrigation system

Based on consultations with The Hashemite Fund for Development of Jordan Badia (BADIA) who are responsible for the output below, and after reviewing the proposal and based on current market prices, they have confirmed that funds allocated for this output would suffice to prepare 8 ponds with a storage capacity of 700-800m^3 that would irrigate up to 75 dunums. Below are the proposed changes.

a. Decrease irrigated area from 100 to 75 dunums.

b. Decrease water storage ponds from 15 to 8.

(4) Outputs 2.8 and 3.8: Permaculture in Jordan

Based on extensive review and assessment that took place between the Permaculture Research Institute and potential local universities/research centres, it was mutually decided that the sets of pre-inception activities suggested in the original proposal set forth are more suitable to the capabilities of the potential local universities/research centres to partner with. This would ensure that the outcome of this output will adhere to the project's goals and objectives. Please note that the sets of activities and targets are enclosed within Jordan's Ministry of Environment endorsement letter.

The above proposed changes are reflected in the enclosed project document in track changes.

UN-Habitat recognizes and is grateful to the Adaptation Fund Board for their continuous understanding and support to our programmes in Lebanon and Jordan. Thank you for your consideration of this request.

Sincerely yours,

Erfan Ali
Regional Representative
Regional Office for Arab States

برنامج الأمم المتحدة للمستوطنات البشرية
UN-HABITAT
المكتب الاقليمي للدول العربية

Annex 4: Project technical review undertaken by the AFB Secretariat and shared with UN-Habitat

ADAPTATION FUND

ADAPTATION FUND BOARD SECRETARIAT TECHNICAL REVIEW OF PROJECT/PROGRAMME PROPOSAL

PROJECT/PROGRAMME CATEGORY: Regional Project

Countries/Region: Jordan and Lebanon
Project Title: Increasing the resilience of both displaced persons and host communities to climate change-related water challenges in Jordan & Lebanon
Thematic Focal Area: Transboundary Water Management
Implementing Entity: United Nations Human Settlements Programme (UN-Habitat)
Executing Entities: Lebanon: UNICEF; RTO; UN-ESCWA
Jordan: UNICEF; JOHUD; HFDJB; MoWI/YWC; PRI; Irbid & Mafraq municipal governments
AF Project ID: AF00000166
IE Project ID:
Requested Financing from Adaptation Fund (US Dollars): USD 13,973,509
Reviewer and contact person: Hugo Remaury
Co-reviewer(s): /
IE Contact Person: Erfan Ali

Technical Summary	The project "Increasing the resilience of both displaced persons and host communities to climate change-related water challenges in Jordan & Lebanon" aims to better respond to climate change impacts and vulnerabilities in the context of the Syrian crisis in Jordan and Lebanon by demonstrating concrete adaptation measures that respond to the needs of both Displaced Persons (DPs) and host communities. This will be done through the four components below: Component 1: Manage urban risks and vulnerabilities in the context of climate change, esp. water scarcity challenges, and urban (population) growth, incl. from DPs migration (USD 1,341,000).

	Component 2: Improve awareness, ownership and capacities to respond to climate change, incl, to operate, maintain and replicate resilient water harvesting, supply and irrigation systems (USD 1,876,671). Component 3: Expand unconventional water harvesting and supply options, using innovative and replicable techniques (USD 7,514,767). Component 4: Improving knowledge and policies and regulations to increase urban resilience in the region (USD 923,162). Requested financing overview: Project/Programme Execution Cost: USD 1,223,210 Total Project/Programme Cost: USD 12,878,810 Implementing Fee: USD 1,094,699 Financing Requested: USD 13,973,509 The initial technical review raises a few issues, such as rationale for changing permaculture demonstration sites, among others, as discussed in the Clarification Requests (CRs) raised in the review. The final technical review finds that the proposal has addressed all of the CRs requests.
Date	8th September 2022

Review Criteria	Questions	Comments Initial Technical Review	Comments Final Technical Review
Country Eligibility	1. Are all of the participating countries party to the Kyoto Protocol?	**Yes.**	
	2. Are all of the participating countries developing countries particularly vulnerable to the adverse effects of climate change?	**Yes.** Climate change is expected to have diverse implications on Lebanon and Jordan's environment, economy, and social structure. Aridity and water scarcity render both countries environmentally sensitive and vulnerable to climate change.	
Project Eligibility	1. Have the designated government authorities for the Adaptation	**Yes**, as per the original endorsement letters dated 20 January 2020	

	Fund from each of the participating countries endorsed the project/programme?	(Lebanon) and 22 January 2020 (Jordan) and letters dated 10 August 2022 (Lebanon) and 17 August 2022 (Jordan).	
	2. Does the length of the proposal amount to no more than One hundred (100) pages for the fully-developed project document, and one hundred (100) pages for its annexes?	**No**, the revised project document is 132 pages long and annexes are 87 pages long. Nevertheless, since the original project document approved (Decision B.35-36/21) was 120 pages and annexes were 79 pages long, this criterion is waived.	
	3. Does the regional project / programme support concrete adaptation actions to assist the participating countries in addressing the adverse effects of climate change and build in climate resilience, and do so providing added value through the regional approach, compared to implementing similar activities in each country individually?	**Yes.** The project addresses water scarcity challenges in countries that experienced an unprecedented influx of displaced people for the past years. It includes concrete measures for water management and supports the development of a regional approach for managing urban risks and vulnerabilities in the context of climate change and urban growth, which may be scaled-up beyond the participating countries. **CR 1**: The rationale behind establishing permaculture demonstration sites in "Local University / Research Center" instead of the Jordan University of Science and Technology (JUST) are unclear. As a result, please 1) clarify why this change is required, outlining its advantages compared to establishing such sites at the JUST;	**CR 1: Addressed,** as per information provided in the response sheet, which clarify why such change is required and describe how Jerash University, a local university/research center was selected.

		2) explain how local university / research center will be selected.	
	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 of the Fund?	**Yes.**	
	5. Is the project / programme cost-effective and does the regional approach support cost-effectiveness?	**Yes.**	
	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? If applicable, it is also possible to refer to regional plans and strategies where they exist.	**Yes.**	
	7. Does the project / programme meet the relevant national technical standards, where applicable, in compliance with the Environmental and Social Policy of the Fund?	**Yes.**	
	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?	**Yes**.	
	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?	**Yes.** **CR 2:** Please assess whether further sustainability arrangements beyond the existing ones are needed because of increased funding allocation for output 3.4.	**CR 2**: **Addressed,** as per information provided on p. 80 to 87.
	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?	**Yes.** **CR 3:** An Environmental Impact Assessment is needed for output 3.4 to ensure compliance with relevant national legislation. In addition, please note that consultations with relevant stakeholders as early as the risks identification stage is required to comply with the AF ESP. Please reflect this requirement in the proposal.	**CR 3: Addressed,** as per information provided on table 13 (p.57-59), p.77-78, p.88 and table 24 (p.102) and Annex 4/ESMP (p. 167-183), which reflect the need for this Environmental Impact Assessment.
	15. Does the project / programme provide an overview of environmental and social impacts / risks identified, in compliance	**Yes.**	

	with the Environmental and Social Policy and Gender Policy of the Fund? Does the project promote new and innovative solutions to climate change adaptation, such as new approaches, technologies and mechanisms?		
Resource Availability	1. Is the requested project / programme funding within the funding windows of the programme for regional projects/programmes?	**Yes.**	
	2. Are the administrative costs (Implementing Entity Management Fee and Project/ Programme Execution Costs) at or below 10 per cent of the project/programme cost for implementing entity (IE) fees and at or below 10 per cent of the project/programme cost for the execution costs?	**Yes**. Cumulative total budget change at output-level between the revised budget and the original budget involves ten per cent of the total budget of the project. Table 6 includes a couple of discrepancies that need to be fixed. **CR 4**: In table 6, please reflect the new funding allocation for outputs 2.4 and 2.6.	**CR 4: Addressed**, as per information provided in table 6 (p.31-37), which does not include discrepancies anymore.
Eligibility of IE	1. Is the project/programme submitted through an eligible Multilateral or Regional Implementing Entity that has been accredited by the Board?	**Yes.**	
Implementation Arrangements	1. Is there adequate arrangement for project / programme management at the regional and national level, including coordination arrangements within countries and among them? Has the potential to partner with	**Yes.** **CR 5**: In the “Legal and financial arrangements” section, please replace “UN-Habitat Project Support Cost” by the equivalent AF	**CR 5: Addressed**, as per information provided on p.98.

	national institutions, and when possible, national implementing entities (NIEs), been considered, and included in the management arrangements?	terminology, i.e., “implementing entity fee”.	
	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 of the Fund?Proponents are encouraged to refer to the Guidance document for Implementing Entities on compliance with the Adaptation Fund Environmental and Social Policy, for details.	**Yes.**	
	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?	**Yes.**	
	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	**Yes.**	

	implementing entity IE fees will be utilized in the supervision of the M&E function?		
	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?	**Yes.**	
	10. Is a disbursement schedule with time-bound milestones included?	**Yes.** **CR 6:** Please confirm whether table 31 (disbursement schedule) is still valid and revise it, if needed.	**CR 6: Addressed**, as per information provided on p.129.

Annex 5: Revised Project Proposal in Track Changes Following the Technical Review by the Secretariat

ADAPTATION FUND

REGIONAL PROJECT/PROGRAMME PROPOSAL

PART I: PROJECT/PROGRAMME INFORMATION

Title of Project/Programme:	Increasing the resilience of both displaced persons and host communities to climate change-related water challenges
Countries:	Jordan, Lebanon
Thematic Focal Area:	Transboundary water management and food security
Type of Implementing Entity:	Multilateral
Implementing Entity:	United Nations Human Settlements Programme
Executing Entities:	**Lebanon**: UNICEF; RTO; UN-ESCWA **Jordan**: UNICEF; JOHUD, HFDJB; MoWI/YWC; PRI; Irbid& Mafraq municipal governments
Amount of Financing Requested:	USD 13,973,509

Project Background and Context

Introduction to the problems and needs

There is little exploration of how urban systems respond to the impacts of climate change combined with a rapid influx of new and often long-term residents. Considering the scale and nature of impacts of climate change and the Syrian crisis in the Mashreq region, an adequate response approach is needed, including concrete adaptation response measures and planning approaches that work in such context.[1]

The Mashreq region is part of the most water scarce region in the world and both urban and rural areas face water challenges. However, some urban areas, especially in Lebanon and Jordan, experience extreme pressure on water availability, both in quantity and quality, exacerbated by climate change, the unprecedented influx of Displaced Persons (DPs), especially from Syria[2] and groundwater over extraction and pollution challenges.

The overall aim of this project is to better respond to climate change impacts and vulnerabilities in the context of the Syrian crisis in Jordan and Lebanon. This is done by demonstrating what concrete adaptation measures (see comp 3) respond to the needs of both DPs and host communities, and especially women and youth, while avoiding any tension over resources and employment opportunities.

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 non-conventional and more sustainable sources, incl. rainwater harvesting and the reuse of treated waste water (see comp 3).

The project will promote the replication and upscaling of the demonstrated techniques and approaches, also beyond Jordan and Lebanon (see comp 4), and to demonstrate how water resources can be assessed, planned and managed more efficiently at the municipal level (i.e. establish urban-rural linkages) and sustainably (by mainstreaming climate change and gender in municipal master plans) (see comp 1).

During project preparation, DPs in the target areas have been identified as the most vulnerable group due to their socio-economic situation and their dependence on often water-vulnerable sectors, especially the agriculture sector. However, to avoid supporting possible increased tension between DPs and host communities, the project also targets host community members. Assessment and planning processes under component 1 and capacity building activities under component 2 will target both DP and host community groups to avoid and even reduce any tension over scare resources and job opportunities.

[1] World Bank et all (2017, policy note September 14): Refugees in the middle east. Bringing an urban lens to the forced displacement challenge.
[2] Ibid

Arab region context

The Arab region is full of potential. Over the past decades, the region has seen significant economic and social progress. However, climate risks threaten to derail these development gains. This could disrupt efforts to build peace, cause a spike in 'eco-migrants,' and undermine efforts to end hunger, poverty and inequality by 2030.[3]

The Arab region is home to high levels of conflict and the world's largest population of refugees and displaced people. Simultaneously, it is now the planet's most water-scarce and food-import-dependent region, and the only region where malnutrition rates have been rising. The Arab region contains 14 of the world's 20 most water-stressed countries. In fact, the region's annual internal water resources amount only 6 percent of its average annual precipitation, against a world average of 38 percent. Overexploitation of natural resources in the region has led to severe ecosystem degradation. Poor land and water management are reducing the potential provision of already limited natural resource services.[4]

Urbanization and population growth are putting severe strains on dwindling natural resources. The population of the Arab countries, estimated at approximately 407 million (2016), with 100 million considered to be in poverty, is expected to reach approximately 635 million by 2050. The Middle East & North Africa (MENA) is the only region in the world where poverty increased between 2011 and 2016; and poverty is projected to increase further by 2030. With low human development index (HDI) rankings for many Arab countries and rampant poverty, the region is also facing internal conflicts over scarce natural resources such as conflicts between rain-fed farmers and pastoralists.[5]

The impacts of climate change are exacerbating the existing challenges of sustainably managing limited natural resources. Current climate change projections show that by the year 2025, the water supply in the Arab region will be 15 percent of the levels in 1960. By 2030 the predominant effects of climate change will include a decrease in precipitation, a drastic rise in average temperatures and an increase in seawater intrusion into coastal aquifers as sea levels rise and groundwater overexploitation continues. Climate change will also have disproportionate consequences for women, poor and marginalized communities who are especially at risk due to their dependence on natural resources.[6]

Lebanon and Jordan socio-demographic, economic and environmental context

The Syrian crisis

Now in its ninth year, the Syrian crisis has had a profound humanitarian, socio-economic, and political impact on the population in both Syria and its neighbouring countries. In recent years, millions of people have been displaced and migrated from Syria.[7] Lebanon and Jordan are among the top DPs host countries: According to a study by UNHCR, Lebanon and Jordan are ranked the largest and second largest refugee-hosting countries in the world compared to the size of their national population, with 173 and 89 refugees per 1,000 inhabitants, respectively.[8]This has placed unprecedented strain on the country's economy, infrastructure, and public services.[9] Although some moved to camps, most (82 percent in Lebanon[10] and 83.5 percentin Jordan[11]) settle in cities, often in informal communities. Unfortunately, due to lack of planning and resources to respond to this large influx, many find themselves in communities that lack basic infrastructure and services, of which water challenges are seen as a major problem,[12] often

[3] UNDP / GEF (2018) Climate Change Adaptation in the Arab States Best practices and lessons learned. Online: https://reliefweb.int/report/world/climate-change-adaptation-arab-states-best-practices-and-lessons-learned
[4] UNDP / GEF (2018) Climate Change Adaptation in the Arab States Best practices and lessons learned
[5] Ibid
[6] Ibid
[7] The Syrian Arab Republic is the biggest sending country of refugees registered by UNHCR in the world (5.5 million out of a total of 18.5 million - UN-Habitat 2018. Migration and inclusive cities: A guide for Arab city leaders
[8] http://reporting.unhcr.org/node/2520 http://reporting.unhcr.org/node/2520
[9] The Government of Lebanon and the United Nations. (2019) *Lebanon crisis response plan 2017-2020 (2019 update)*. 2019 Edition. Lebanon: The Government of Lebanon and the United Nations.
[10] Ibid
[11] UNHCR fact sheet, October 2019.
[12] See Jordan and Lebanon INDCs and Lebanon crisis response plan 2017-2020

leading to health and livelihood issues (as most DPs work in agriculture and this sector is heavily dependent on water availability) and social unrest.[13] Moreover, the majority of DPs from Syria live under the poverty line[14] and lack legal residency making it difficult for them to secure income.

At the programmatic level, the Regional, Refugee and Resilience Plan (3RP) responds to the Syrian crisis and is conceptualized of two inter-connected components. The refugee component addresses the protection and humanitarian assistance needs of refugees living in camps, in settlements and in local communities in all sectors, as well as the most vulnerable members of impacted communities. The 3RP resilience component addresses the resilience, stabilization and development needs of impacted and vulnerable communities in all sectors, strengthens the capacities of national and sub-national service delivery systems, strengthens the ability of governments to lead the crisis response, and provides the strategic, technical and policy support to advance national responses.

Despite support from the National governments, civil society and the international community, the needs of affected communities are outpacing the resources and capacities of partners, and coping mechanisms of the most vulnerable are being severely tested. As there are limited numbers of Syrian DPs returning, there are worrying signs of heightened tensions and host-community fatigue. In this context, it is essential for the international community to maintain its solidarity and support, especially since there is a lack and decline in funding for support to countries like Jordan and Lebanon that face DPs crisis.[15]The regional approach of this project aligns with the 3RP sector objectives, especially for the WASH sector (see annex 1 for more info).

Lebanon context

Lebanon is located on the eastern basin of the Mediterranean Sea, with a surface area of 10,452 km2, a coastline extending on 225 km and a landscape characterized by mostly mountainous areas. Economic trends in Lebanon remain sluggish, with all segments of the economy struggling and competitiveness being undermined by the loss of major trading routes and regional markets, especially against the most recent political turmoil and demonstrations. Against this background, in 2017, Lebanon began developing its vision for stability and sustainable long-term growth and job creation, which is accompanied by important sectoral and structural reforms as well as a major infrastructure programme, the Capital Investment Plan (CIP).

The CIP calls for over $20 billion in funding for 250 projects scheduled over the next decade, until 2030, focusing on investments in priority sectors, such as water, energy, transportation, and solid waste, among others.[16] However, Lebanon faces important challenges, especially related to water resource management and the Syrian crisis.

Environmental and water challenges: Water resources in Lebanon are under stress. Available water, including from rivers and springs, storage dams and groundwater, exceed projected water demand.[17] In 2010, total water supply reached 1,377 (MCM)/year originating from surface water (46 percent), groundwater (51 percent), and used storage (3 percent). Groundwater is over-extracted (0.7 BCM against total recharge of 0.5 BCM). In 2012, Lebanon was already using two thirds of its available water resources. This rate of water withdrawal is very high compared to global standards (averaging 10-30 percent), and includes a substantial component of resource mining, depleting Lebanon's water capital[18]. In addition, widespread pollution and substandard water infrastructure are restricting the ability of the government to meet water demands in the future.[19]

Lebanon is also generating ever increasing quantities of domestic and industrial wastewater, all of which requires treatment. The country has invested in wastewater facilities over the last two decades. As a result of this investment, about two-thirds of the population is connected to sewer networks but only 8 percent of

[13] https://video.ecc-platform.org/videos/links-between-migration-and-climate-change
[14] UN 3RP: Regional Refugee & Resilience Plan 2018-2019.
[15] Ibid.
[16] UN for Lebanon annual report 2017
[17] UNICEF Evaluation of the Water, Sanitation and Hygiene (WASH) Programme within the UNICEF Country Programme in Lebanon (2013-2016)
[18] Ministry of Environment, EU and UNDP: Lebanon Environmental Assessment of the Syrian Conflict & Priority Interventions 2014
[19] UNICEF Evaluation of the Water, Sanitation and Hygiene (WASH) Programme within the UNICEF Country Programme in Lebanon (2013-2016)

wastewater reaches the operational wastewater treatment plants and is treated. A considerable amount of the installed treatment capacity is not being exploited.
The environmental costs of this situation are severe. Most wastewater collected is discharged without treatment, into watercourses and the sea. Where there is no network, cesspits are used with considerable seepage into groundwater. Few industries pre-treat their effluent, so harmful waste is discharged into the sewer system or the environment. While all the water resources are being impacted by bacteriological contamination, in agricultural areas, the runoff and infiltration of fertilizer and pesticide residues is exposing these water resources to further environmental degradation. Furthermore, runoff from urban areas may contain heavy metals and hydrocarbons, which could impact the quality of receiving waters.

The negative environmental impacts of poor wastewater collection and treatment have the knock-on effects of increasing health costs, polluting water resources and soils, and reducing income from amenities and tourism. This situation is the result of years of political instability, poor planning and scattered responsibilities within the sector.

Demographic challenge: With a total population of 6,848,925 million in 2018,[20] Lebanon's population has almost doubled since 2000. The largest increase took place during the last decade, especially because of the large influx of DPs since the Syrian Crisis started in 2011. This relatively high population growth rate puts pressure on government spending to deliver basic public services, and to stimulate economic development. According to the latest WB Lebanon Economic Monitor report,[21] 27 percent of the Lebanese population are poor and around 8 percent live in severe poverty conditions with less than 75 US dollars per month. The poverty rates in all Lebanon increased by 61 percent between 2011 to 2016. While the national unemployment rates passed the 30 percent, out of which 36 percent of youth groups from both genders. In the Bekaa governorate, the poverty rate is highest with 38 percent.

Economic and fiscal challenges: Economic growth (at constant factor process) for 2020 is expected to be -0.1 percent and 0.3 at constant market prices. This will be mainly driven by the agriculture and industry sectors. Public finances remain structurally weak and are expected to worsen and are in urgent need of reforms. Public debt continued to rise (155.6 percent of GDP expected in 2020), due to low growth and a relatively high cost of debt financing.[22] However, these estimates remain uncertain due to the mass protests that swept across Lebanon shortly after the government announced new tax measures on 17 October and which are still ongoing.[23]

DPs crisis: one of the key issues facing Lebanon is the **economic and social impact** of the Syrian crisis.[24] According to government and independent sources, up to 1.5 million Syrians, about a quarter of the Lebanese population, have taken refuge in Lebanon since the conflict erupted in March 2011. This has strained Lebanon's public finances, service delivery, and the environment. 76 percent of the Syrian DP households subsisted below the poverty line and more than 50 percent of Syrian households live in extreme poverty.[25] The crisis also worsened poverty incidence among Lebanese citizens as well as widen income inequality. In particular, it is estimated that as a result of the Syrian crisis, some 200,000 additional Lebanese have been pushed into poverty, adding to the erstwhile 1 million poor. An additional 250,000 to 300,000 Lebanese citizens are estimated to have become unemployed, most of them unskilled youth. According to the Lebanon Crisis Response Plan, [26] many of the most vulnerable communities in Lebanon are concentrated in specific pockets of the country: the majority of deprived Lebanese (67 percent) and persons displaced from Syria (87 percent) live in the country's most vulnerable cadastres, incl. in the Bekaa area (see also annex 1).

The Syrian conflict and the influx of DPs to Lebanon coincided with a period of severe water shortage, further stressing the scarce water resources and the under-developed water and wastewater infrastructure in the country. By the end of 2014, the incremental increase in domestic water demand for refugees was

[20] World Bank (2019) *Population, total*. [Online] Available from: https://data.worldbank.org/country/lebanon [Accessed 10 January, 2020]
[21] World Bank (2017). Lebanon Economic Monitor. (Online) Available from: http://documents.worldbank.org/curated/en/568551493132224115/pdf/114552-v1-WP-PUBLIC-4-26-7AM-47p-LEM-Spring-2017.pdf
[22] World Bank (2019) *Macro Poverty Outlook: Country-by-country Analysis and Projections for the Developing World*. October 2019 Edition. World Bank
[23] Amnesty International (2020) Lebanon Protests Explained: Mass demonstrations. Available from: https://www.amnesty.org/en/latest/news/2019/11/lebanon-protests-explained/ [Accessed 15 January, 2020]
[24] https://www.worldbank.org/en/country/lebanon/overview
[25] VASYR 2017: Vulnerability Assessment of Syrian Refugees in Lebanon
[26] https://www.unhcr.org/lb/wp-content/uploads/sites/16/2019/04/LCRP-EN-2019.pdf

expected to reach 43 to 70 MCM, corresponding to an increase in water demand of 8 to 12 percent at the national level, with the Bekaa having the highest share. As for the wastewater generation rates, DPs contribution was an increase of 34 to 56 MCM by the end of the year 2014, resulting in an increase of 8 to 14 percent in wastewater generation at the national level with the Bekaa having the highest share.[27]

Host community fatigue is becoming more and more pronounced, and tensions between and within communities have been on the rise. Perceived competition for lower-skilled jobs was identified as a key driver for these tensions. Between 2014 and 2017, the percentage of Lebanese who did not report any inter-community tensions dropped from 40 to 2 per cent.[28] Most DPs (around 85 percent) settle in urban areas. The Bekaa valley, which is relatively close to Syria, hosts most of the Syrian DPs.[29]

According to a recent labour survey dated the 16 of January 2020, and due to the ongoing economic crisis in the country and the large protests that raged in all Lebanese territories, the estimated number of people who lost their jobs as per December 2019 was 160,000 and the number is subject to increase. Imports of basic commodities have decreased from 500,000 tons in July 2019 to less than 250,000 tons in November 2019. The survival expenditure basket prices (especially food items) increased to merely 25% from October to December 2019.

According to CAS-ILO Household survey 2019, Lebanon labour force is segregated to 76% in services, 4% in Agriculture, 20% in industry. And seen the current situation, the threat to access local food products increased and the demand for basic food items between host Lebanese communities and refugees' communities also increased, this has also increased poverty rates according to sources. Versus, all these challenges, serious measures by the international community were established to enhance local agri-businesses. The latter remains also a challenge seen the urgent environmental challenges stated above especially those related to water depletion and pollution.

Jordan context

Jordan is located about 80 km to the East of the Mediterranean Sea. Located at the heart of the Middle East, Jordan is a middle-income county shaped by its geography, history, geopolitics and scarcity in natural resources.[30] Over the past ten years, Jordan has had success pursuing structural reforms in education, health and privatization and liberalization. The Government of Jordan has introduced social protection systems and reformed subsidies, creating the conditions for public-private partnerships in infrastructure and making tax reforms.[31] However, the country faces important challenges. Macroeconomic vulnerabilities persist mainly due to its energy import dependency. Regional tensions and their recent extension to Iraq and Syria are weighing down on the Jordanian economy through a widening trade deficit and weaker investor confidence. According to the Department of Statistics unemployment rates reached 19.2 percent in the second quarter of 2019, male unemployment is at 17.1 while female unemployment is at 27.2 percent,[32] youth unemployment (ages15-24) according to ILOSTAT database was estimated at 36.7 percent in 2019.[33] Dependency on remittances from Gulf economies are additional threats to economic stability.[34]

Environmental and water challenge: Issues in Jordan are to some extent similar to those in Lebanon. However, Jordan is an even more water scarce country. In fact, it is the second most water scarce country in the world. Water demand distinctly exceeds supply as the annual water availability per capita has declined significantly, from 3,600 m^3 per capita in 1946 to only 145 m^3 in 2008.[35] If supply remains constant, per capita domestic consumption is projected to fall to 90m^3 per person per year by 2025, putting Jordan in the category of having an absolute water shortage that could constrain economic growth and potentially endanger public health.[36] Jordan requires about 1,400 MCM annually (2014) but has, on average, only 848 MCM of freshwater supply available for various uses. Non-revenue water accounts for approximately

[27] Ministry of Environment, EU and UNDP: Lebanon Environmental Assessment of the Syrian Conflict & Priority Interventions 2014
[28] Regular Perception Surveys on Social Tensions throughout Lebanon (ARK, 2017), and Defining Community Vulnerability in Lebanon, REACH (2014).
[29] https://data2.unhcr.org/en/situations/syria/location/71#_ga=2.248854471.1978193527.1540994637-1966626473.1540994637
[30] Jordan TNC (2014)
[31] Hashemite Kingdom of Jordan, UNICEF and UNDP (2015) Socio-economic inequality in Jordan
[32] http://dosweb.dos.gov.jo/19-2-unemployment-rate-during-the-second-quarter-of-2019-2/
[33] https://data.worldbank.org/indicator/SL.UEM.1524.ZS?locations=JO
[34] Hashemite Kingdom of Jordan, UNICEF and UNDP (2015) Socio-economic inequality in Jordan
[35] MoWI (Ministry of Water and Irrigation, Jordan) (2009): Water for Life. Jordan's Water Strategy.
[36] National Climate Change Strategy of Jordan, 2013

50% of total water consumption. In 2014, 229.3 Million Cubic Meters (MCM) were lost, out of the 428.1 MCM delivered for municipal needs, the MoWI strategy includes the reduction of non-revenue water from 52% to 25% by 2025.[37]The increased demand for water has caused over abstraction of water resources to reach 160 percent in 2014.[38] According to the Ministry of Water, of Jordan's 12 groundwater basins, 10 are being pumped at a deficit. Overall, groundwater is being extracted at twice the rate that it is replenished. In 2017, 50.3 percent of the Jordanian population had 24 h/week of piped water supply or less and 49.7 percent of Jordanians were listed with higher than 24 supply/week[39]. This trend will make some areas unliveable, reduce agriculture lands and put more pressure on already scarce water resources, potentially increasing displacement, the continuous risk of social unrest and conflicts and migration to host settlements already struggling to provide basic services.

Demographic challenge: With a total population of 10,558,717 in 2020,[40] Jordan's population has grown very rapidly, doubling more than ten times in 55 years. The largest increase took place during the last decade, especially because of the large influx of DPs since the Syrian Crisis started in 2011. This relatively high population growth rate puts pressure on government spending to deliver basic public services, and to stimulate economic development. Jordan registered an absolute poverty rate of 15.7 per cent for Jordanians only in 2018 while 78 per cent of the Syrian population is highly vulnerable, living below the Jordanian poverty rate[41]

Economic and fiscal challenges: The elevated level of debt equivalent to 94.23 percent of Jordan's GDP in 2018 is of concern.[42] As for the water sector, increased financing needs of the Water Authority of Jordan (WAJ), which is government owned, continues to pressure this debt situation as operation and maintenance cost recovery is not expected until 2021. Economic growth for 2019 is expected to be 2.4 percent.[43]

DPs crisis: Jordan has a long history of accommodating DPs. However, the scale of the current DPs crisis compounds the existing socio-economic and environmental pressures in Jordan. There has been an increased competition for access to public utilities (water and electricity), education, health services, infrastructure, and employment, as well as pressure on the already limited carrying capacity of Jordan's natural resources. Similar to Lebanon, most DPs (around 83.5 percent) settle in urban areas. The Northern governorates of Irbid, Mafraq and Zarqa saw the largest influx of refugees relative to the total population,[44] leading to increased demand for public services.[45] Each Syrian refugee costs the water sector around 620 US$/year[46].

Climate change

Lebanon

As mentioned in Lebanon's Nationally Determined Contributions (NDC): 'adaptation is a priority for Lebanon. Being a developing country with scarce water resources and high population density, Lebanon is already facing and will continue to face, significant challenges as a result of climate change. The government of Lebanon recognizes that the more sustainable its development path is, the easier it will be to build resilience to climate change impacts.' Priority sectors are water, forestry & agriculture and biodiversity.

Climate: Lebanon has a Mediterranean-type climate characterized by hot and dry summers and wet and cool winters, with an average annual temperature of 15℃. Lebanon has an arid / semi-arid climate, which makes it poor in water resources availability.[47]

[37]Ministry of Water and Irrigation: Water Facts and Figures 2017
[38]Jordan National Water Strategy 2016-2025
[39]Ministry of Water and Irrigation: Water Facts and Figures 2017
[40]Department of Statistics. Online. http://dosweb.dos.gov.jo/
[41]UNICEF. (2018). Geographic Multidimensional Vulnerability Analysis. Online: https://reliefweb.int/sites/reliefweb.int/files/resources/Summary%20English.pdf
[42]https://tradingeconomics.com/jordan/government-debt-to-gdp
[43] World Bank. Online: https://data.worldbank.org/country/jordan
[44]https://data2.unhcr.org/en/situations/syria/location/36#_ga=2.22371195.1978193527.1540994637-1966626473.1540994637
[45] Hashemite Kingdom of Jordan, UNICEF and UNDP (2015) Socio-economic inequality in Jordan
[46] Ministry of Water and Irrigation: Water Facts and Figures 2017
[47] Lebanon TNC (2016)

Climate change projections: According to climate models[48], temperatures are expected to increase with 1.7°C by mid-century and up to 3.2°C by 2100 and a decrease in precipitation of 4 to 11 percent with drier conditions by the end of the century (up to 5.8 mm decrease in average monthly precipitation). Projections also show increasing trends of warming, reaching up to 43 additional days with maximum daily temperature higher than 35°C and an increase in the number of consecutive dry days when precipitation is less than 1.0 mm by the end of the century, causing the seasonal prolongation and geographical expansion of drought periods. This combination of significantly less wet and substantially warmer conditions will result in hotter and drier climate.

Climate change impacts (on vulnerable sectors and areas), including the water sector: The projected changes in rainfall will put tremendous pressure on national water security and produce knock-on effects in sectors such as agriculture, where around 70 percent of the available water is being used for irrigation. The decline in precipitation will also negatively affect the recharge of rivers and groundwater. Snow will melt earlier in spring, affecting spring recharging and decreasing water availability for irrigation in summer. Annual drought periods are expected to start 15 days to 1 month earlier and will be 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. In Zahle, projections show a 6-15 percent decrease in the annual total rainfall (mm)/number of days by 2098 under the SRES A1B scenario.[49] Anticipated changes in climate would reduce the nation's exploitable supplies of water by about 8 percent in 2040, and 29 percent in 2080[50]. (This is even aggravated by the fact that water demand in Lebanon increased 28 percent between 2011 - 2017, which is directly linked to the Syrian crisis.[51] For more info about climate change scenarios and vulnerabilities in the project target areas see annex 1.An Inter-Agency vulnerability mapping based on several criteria[52], showed that central Bekaa cadastres are classified as most vulnerable due to the Syrian crisis with high pressure on resources. A similar exercise at district level was conducted jointly by UN-Habitat and UNICEF in 2018, where a workshop was held with stakeholders[53] selected for their district-wide knowledge. The outcome was a ranking of disadvantaged areas.[54]Subsequently, the score was coupled with the respective Multi-section Vulnerability Index (MsVI)[55] score of an area's cadastre. The study showed that the Bekaa area and its population is vulnerable to climate change, especially water and related agriculture production and dependence on this sector for income, especially for Syrians.

Jordan

As mentioned in Jordan's National Climate Change Policy: 'Jordan faces potential serious impacts on its natural ecosystems, on its river basins and watersheds, on biodiversity—then cascading to impacts on food productivity, water resources, human health, public infrastructure, and human settlements. Climate change will have serious implications on the country's efforts to eradicate poverty and realize sustainable development for current and future generations— ultimately making climate change an issue of intergenerational equity. Climate change scenarios indicate that Jordan and the Middle East could suffer from reduced agricultural productivity and water availability among other negative impacts.'

Climate: Jordan is located about 80 km to the East of the Mediterranean Sea with a predominantly Mediterranean climate; hot and dry summers and wet and cool winters. Jordan is divided into three main climatic regions: the Ghor region (lowlands), Highlands, badia and Desert region.[56]

Climate change projections: Climate models[57] show a consistent trend towards a drier climate and annual precipitation tends to decrease significantly with time. The mean and maximum temperatures over the full country of Jordan will be 2-4 degrees higher, precipitation will be 15-20 percent lower and potential evapotranspiration about 150 mm higher by the end of the century. The decrease in precipitation would be

[48] Ibid
[49] Ministry of Environment and UNDP (2011) Lebanon Second National Communication on Climate Change – Public Health
[50] Lebanon Third National Communication on Climate Change
[51] Lebanon crisis response plan 2017-2020
[52] Using Multi Deprivation Index (MDI) at household level.
[53] Stakeholders involved governmental representatives, including the qaem maqam (head of a district), head(s) of union(s) of municipalities of a district, and representative(s) of Social Development Centre(s) (SDC[s]); local stakeholders (civil society organizations and local non-governmental organizations);representatives of UNICEF zonal offices; and UN-Habitat area coordinators.
[54] Criteria were: (1) extreme poverty, (2) presence of refugee population, (3) existence of slums/substandard housing, (4) out-of-school/working children, (5) frequency of incidence of violence in the community, (6) overburdened public services, and (7) deficiencies in basic urban services.
[55] Developed by UNICEF Lebanon (in 2017) as a child-focus vulnerability index.
[56] Jordan TNC (2014)
[57] Jordan's Third National Communication Report to UNFCCC (2014)

more prevalent in the western part of the country. Simultaneously, the mean, maximum and minimum air temperature tends to increase significantly by 0.02, 0.01, and 0.03 °C/year, respectively. On the other hand, the relative humidity tends to increase significantly by an average of 0.08 percent/year. In addition, projection show that heat waves and drought events, dry days will be more frequent.

Climate change impacts (on vulnerable sectors and areas), including the water sector: Jordan's Third National Communication (TNC) Report to UNFCCC[58] has developed a socioeconomic analysis to determine expected vulnerabilities and impacts of climate change on local communities and their adaptive capacities by employing socioeconomic and adaptation analysis tools on the pilot area composed of four villages in the Amman- Zarqa Basin, near Irbid and Jerash, two main territories of the three regions of this proposal. The study used the *income* (and climate sensitive employment assessment) as a main critical indicator to the sensitivity of local community to the climate change. The importance of these indicators is linked to the impacts of climate change on the yield agricultural productivity at the study site especially that 54.47 percent of the community income based on agriculture which was considered the most sensitive sector to climate change. Previous studies and strategic documents (i.e. Jordan's SNC (2009) and National Climate Change Policy (2013), Jordan's TNC (2014) have identified scarcity of water resources as one of the major barriers facing sustainable development in Jordan; a situation that will be magnified by climate change,[59] leading to more water stress. Due to climate change-induced drought, the average agricultural production declined by 25–50 percent in 1999–2000 and agricultural production entirely failed in many areas of land. Furthermore, wheat production declined by 12–20 percent of the total average, and the productivity of rangelands declined by 50 percent. In that season, agricultural production losses as a result of drought were estimated at around US$57 million. More recently, the latest figures show that rainfall in September 2014 was less than half the average expected[60]. Water-related impacts also include reduced total water availability, less reliable seasonal patterns, increasing intensity of droughts during which reservoirs are not refilled, and groundwater does not recharge. Flood events will also be more likely, in 2018 flash floods claimed 35 lives and affected 150,000 people.[61] High rainfall events also increase erosion which causes losses of soil water storage and siltation of reservoirs. Higher temperatures cause higher evaporative demand and hence higher irrigation water demand. Higher temperatures also affect the efficiency of wastewater treatment plants.[62] Jordan has been subjected to additional water stress due to the influx of displaced peoples, especially from Syria. There are indications of pollution of the main aquifer lying beneath the Zaatari camp due to wastewater leakages. Besides that, groundwater, including the Amman-Zarqa aquifer,[63] is being overpumped. For more info about climate change scenarios and vulnerabilities in the project target areas see annex 1.

Climate change vulnerabilities assessment and hot-spot mapping approach

Global-, MENA and National climate change models and data have been used to understand climate change trends and projections in Jordan and Lebanon and to justify this project, focused on addressing water-related challenges in the target areas in both countries.

Target areas / municipalities have been selected by identifying which areas experience most pressure on water-related services, exacerbated by climate change impacts and the influx of DPs. Irbid and Mafraq in Jordan are the municipalities that host most DPs after Amman. In Lebanon, the Bekaa area, in which Zahle and the three surrounding target municipalities are located, hosts most DPs. See Annex 1 for more info. As labelled by the WB,[64] cities under widespread stress from displaced persons – which significantly impacted the overall absorption capacity, including urban systems and services such as water supply (exacerbated by climate change), sanitation, education, and health services, are called 'type 2' cities.

During project preparation, data has been collected required to map climate change vulnerable hotspots (see approach in figure 2 below) and develop response plans (i.e. identify appropriate adaptation measures) to address specific vulnerabilities in these hotspot areas. This has been done through a

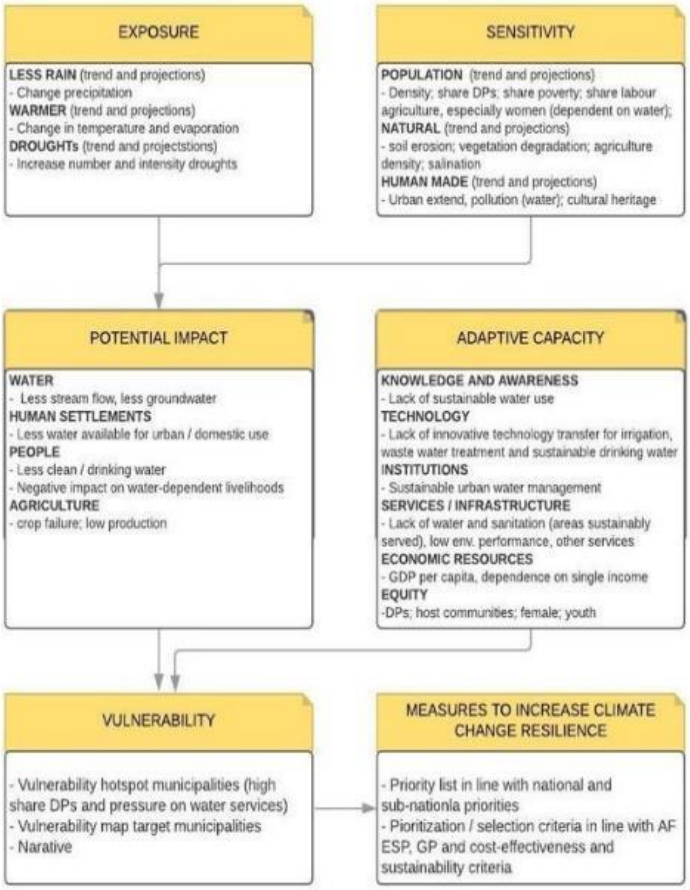
[58]Government of the Hashemite Kingdom of Jordan & UNDP (2014). Jordan's Third National Communication on Climate Change
[59] Ibid
[60]UNEP 2015:Climate Change in the Arab Region (Regional Coordination Mechanism Report)
[61]UNDP/ National Centre for Security and Crises Management (NCSCM): Jordan National Disaster Risk Reduction (DRR) Strategy 2019-2022
[62] Jordan Ministry of Water and Irrigation: Climate Change Policy for a Resilient Water Sector, 2016, page 3
[63] UN-ESCWA et al. (2017) Arab Climate Change Assessment Report (RICCAR initiative)
[64] World Bank et all (2017, policy note September 14): Refugees in the middle east. Bringing an urban lens to the forced displacement challenge

combination of research and a comprehensive planning and consultation process (see section II.I), including with vulnerable groups.

Figure 1: Typology of settlements[65]

Figure 2: Climate change vulnerability assessment and hotspot mapping approach (UN-ESCWA approach)

[65]World Bank et all (2017, policy note September 14): Refugees in the middle east. Bringing an urban lens to the forced displacement challenge



Project target areas

There is evidence[66] that water challenges will likely grow for Irbid, Mafraq and Zahle and surrounding municipalities in the future due to climate change impacts. There is also a clear link between the influx of Syrian DPs and increasing pressure on water resources in these areas. Both challenges are coupled with adaptation challenges in both countries. Common adaptation challenges for the two countries are financial constraints to implement climate action. For example, the financial deficit in the municipality budget for Greater Mafraq has reached 107 percent due to the impact of the influx of Syrian DPs[67]. Also, there is a lack of awareness at the community level, weak coordination between relevant authorities and a need to spend more on research and capacity building to apply low-cost innovative solutions.[68]

Many of the DPs have now been in the host country for five or more years. As most DPs live in cities, solutions focused on their needs and negative climate change impacts must target host cities and towns.[69] The shift from a focus on camps to cities and towns means changing the paradigm for how humanitarian and development agencies work with DPs. Instead of providing stand-alone solutions to DPs in camps or rural areas, the challenge is to establish urban – rural linkages and support host communities to adapt /

[66] See sections above
[67] ILO (2016) Local Economic Development Strategy For Mafraq Governorate (2016-2018)
[68] Jordan Third National Communication on Climate Change and Lebanon Third National Communication on Climate Change
[69] Idem page 21

scale up existing services, shelter and jobs to meet the needs of both the original residents and DPs,[70] considering the impacts of climate change, especially increasing water challenges, on these services.

The Jordan Refugee Response Plan identifies the Northern region as highly vulnerable (including Irbid) while the East (Mafraq) is the second highest region in the percentage of DPs rated highly vulnerable or above.[71] Syrian DPs in Jordan and Lebanon are specifically vulnerable to climate-induced water challenges. The Vulnerability Assessment Framework 2019 shows 11 percent of the Syrian DP population as having high or severe VAF WASH indicator vulnerability, while this indicator might appear very low, sub-indicators reveal much higher levels of vulnerability, namely expenditure on WASH items, 58 percent reported spending more than five per cent of expenditures on water.[72]In Lebanon, 42 percent of households rely on bottled water.[73]In Bekaa, Lebanon—where Zahle is located—the unemployment rate (unemployed over labour force), 61.9 percent, is the highest amongst all Lebanese Governorates and almost double the total unemployment rate nationally (31.3 percent). Moreover, the Bekaa Governorate is the second lowest when measuring the percentage of "households with members working in the past 7 days" with an average of 36.4 percent compared to the lowest 30.1 percent in Baalbek El-Hermel Governorate and as compared to 59.4 percent nationally.[74]

In addition, there is a number of specific challenges across the region, including limited job access and livelihoods opportunities, exhaustion of savings, and the adoption of negative coping mechanisms, which further exacerbate the residual protection risks they face. Broader political and social pressures can also affect stability between displaced populations and host communities in both countries. There are over 10,000 Syrian displaced children recorded in the Arab region as either separated, unaccompanied or in institutional care.[75] The loss of social networks further decreases the adaptive capacities and make DPs more vulnerable to climate change.The 2015 population census[76] estimates the population of Irbid governorate at 1,770,158 (Syrian DPs 134,649)[77], Qasabit Irbid, Bani Obeid and Ramtha target area populations are estimated at 739,212 (Syrian DPs 165,843), 204,313 (Syrian DPs 48,574) and 238,502 (Syrian DPs 68,306) respectively. The population of Mafraq governorate was estimated at 549,948 (Syrian DPs 161,977[78]), Qasabit Mafraq, Al-Ghadeer Al-Abyad and Akaider targeted area populations are estimated at 124,479 (Syrian DPs 39,359), 1,661 (Syrian DPs 166) and 1,649 (Syrian DPs 165) respectively. Disaggregated data and the overview of climate change concerns for each target area are shown in Tables 1 and 2.

Lebanon

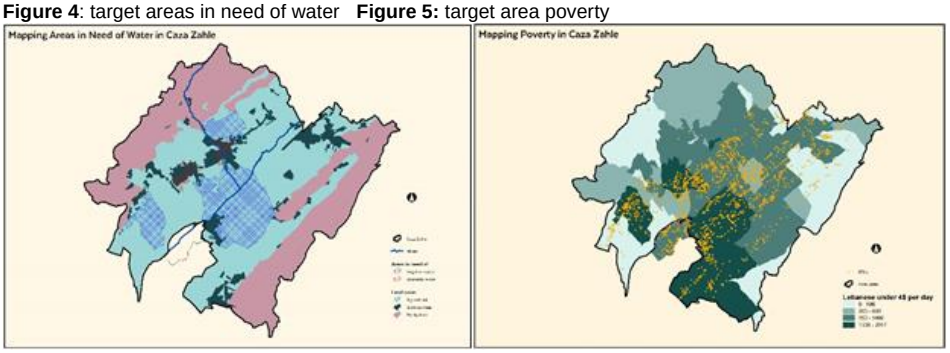
Figure 3: Target municipalities in Lebanon

[70] Idem
[71] UNHCR (2015) Jordan Refugee Response Plan
[72] UNHCR (2019) Vulnerability Assessment Framework https://data2.unhcr.org/en/documents/download/68856
[73]UNHCR, UNICEF and WFP. (2019) *VASyR 2019:Vulnerability Assessment of Syrian Refugees in Lebanon*.
[74] Ibid
[75] UN 3RP: Regional Refugee & Resilience Plan 2018-2019
[76] Jordan in Figures 2017 - Page 7 http://dosweb.dos.gov.jo/DataBank/JordanInFigures/JORINFIGDetails2017.pdf
[77] UNHCR - https://data2.unhcr.org/en/situations/syria/location/36
[78] Ibid

Zahle and surrounding area lies in central Bekaa valley and has an annual rainfall of between 200-600 mm[79]. Figure 3 shows the administrative boundaries of Zahle and the surrounding municipalities. The target areas in Zahle have been identified based on a high share of vulnerable communities. The total populations and disaggregated data and an overview of climate change issues and adaptation needs for each municipality are shown in table 1.

Figure 4 shows communities in most need of water resources, which have been combined with figure 5, which shows poverty distribution in Zahle area among vulnerable Lebanese communities (living under 4US$ per day, as per the World Bank data, 2011) and location of vulnerable Syrian displaced population living in Informal Tented Settlements (ITSs). The maps also show the land cover with agricultural and built areas, which has been used to identify vulnerable farmers and vulnerable urban populations.

Figure 4: target areas in need of water **Figure 5:** target area poverty



Focus group consultation and key informant interviews have been held in the target municipalities (see section II.I.) with the purpose to identify specific issues and needs regarding climate change-related water issues and possible concern regarding proposed adaptation actions (see outcomes in table 1). Drought has been identified as the most problematic hazard in the city of Zahle and its surrounding municipalities during the past 10 years. In general, the surrounding municipalities suffer from extreme heat that has been increasing, especially in the years between 2016 and 2018. In 2017 and 2018, flooding has also been a major concern for the target areas. This trend coincides with the predictions of Lebanon's Third National Communication to the UNFCCC for generally prolonged drought periods all over the country, increase in average temperature and increase in winter flooding by up to 30 percent.

Moreover, according to climate predictions from the PRECIS model, 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. 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 (MoE, 2011).

Zahle: During the past 8 years, the amount of rainfall and upstream melting snow serving the area has noticeably decreased, causing boreholes to dry out in the summer in addition to becoming increasingly contaminated. The agriculture sector is especially vulnerable, not only to climate change-related increased water scarcity, but also groundwater pollution. As most of the Syrian DPs work in this sector, their jobs are dependent on the resilience of the sector and the use of non-conventional clean water resources. For instance, Haouch El Oumara's targeted community of host Lebanese population in Zahle has identified drought and extreme heat as the main climate change hazards in their area, especially in the years 2017 and 2018. The rainfall season shifted to the end of winter- beginning of spring, with heavy downpours. As

[79] Farajalla et al. (2014): Climate Change in Lebanon: High-order Regional Impacts from Agriculture http://website.aub.edu.lb/ifi/publications/Documents/working_papers/20140722_Higher_order_CC.pdf

a result, water infiltration into the underground water table has reduced and so has lowered the water table. Twenty years ago, the water table in summer was 80 m underground in Zahle and nowadays one has to dig to 150 m to reach the water table. Existing boreholes are drying out in summer and supplying less water in winter. Farmers started digging deeper boreholes to reach the water table. This water scarcity has increased the cost of crop production due to the need to pump water from deeper boreholes. As a result, some farmers have lost their livelihoods as they are failing to compete with cheaper imported products. This has also caused farmers to use the polluted water of Litani River, which in turn increased diseases in the surrounding area. According to the community, Lebanon is the third in the world in the rate of cancer, with the central Bekaa area (around Litani River) having the greatest share of cancer patients (800 cases in Bar Elias alone). These water scarcity issues have been also exacerbated by the increased temperature that increased the water need for plants as well as caused crop damages and spread of new types of insects. Consequently, farmers are using pesticides more often.

Bar Elias, Ablah, Hazerta, El-Marj, Ferzol, Qaa El-Rim, Taanayel, Taalabaya and Terbol:Similar to Zahle, all areas in the Bekaa region have witnessed various water-related problems. It is said that factories, mainly located in Zahle, and sewage lines in the area have been dumping their waste in the Litani River without prior treatment. This has heightened reported health problems, and which include the spread of diseases and elevated cancer rates in the Bekaa. Also, the residents have addressed concerns related to the presence of bad odours in and around the area. Drought and flood incidents have led to crop damage, surface water pollution and decreased water quality and groundwater depletion.

Bar Elias, Ablah, Hazerta, El-Marj, Ferzol, Qaa El-Rim, Taanayel, Taalabaya and Terbol:Similar to Zahle, all areas in the Bekaa region have witnessed various water-related problems. It is said that factories, mainly located in Zahle, and sewage lines in the area have been dumping their waste in the Litani River without prior treatment. This has heightened reported health problems, and which include the spread of diseases and elevated cancer rates in the Bekaa. Also, the residents have addressed concerns related to the presence of bad odours in and around the area. Drought and flood incidents have led to crop damage, surface water pollution and decreased water quality and groundwater depletion.

Qab Elias and Saadnayel: The drinking water being distributed (e.g. by World Vision in Qab Elias is not enough for all the ITSs and at the same time boreholes are drying out in summer due to the increasing drought incidents. Due to the fact that 68 percent of the targeted communities in both municipalities are unemployed, most of the community cannot afford to buy drinking water and so collect water from untested water sources. Since women and children are responsible for domestic work and water supply, they are facing safety issues while walking away from ITS to collect water. Another safety concern—especially for children, elderly and disabled people—is the damage caused by the increased flooding causing loss of shelter. This is in addition to the fires in ITS due to increased heat that melts electrical wires. Skin diseases have also spread among the community due to decline in hygiene caused by water scarcity. While other diseases such as respiratory diseases and fever have increased mainly among children due to increased temperature which also caused an increase in the numbers of insects and rodents. The river stream dries in summer and so is filled with wastewater which has also caused spread in insects and rodents carrying diseases. However, government priorities don't focus on the ITSs.

The agriculture sector in Zahle district is mainly fed by conventional water systems, such as water channels, open water sources and other badly operated drip irrigation systems. The main two rivers are the Berdawni river (a seasonal river) and the Litani river. Based on several reports, the Litany is highly subjected to pollution mainly due to municipal wastewater and industrial waste. This pollution has also affected the agri-businesses in the region, yet affecting livelihoods of several farmers in the area.

It is also important to note finally that an unprecedented financial crisis has crippled Lebanon since 2019 driving 82% of the total population (including refugees) below poverty line, of which 40% are below extreme poverty.[80] In this context, a significant trend of local farming has transpired, as a primary means for self-sustenance, and food security. Mitigating the challenges associated with the development of local farming is evidently very important which includes among others the maximization of irrigation water supply through sustainable water sources such as rainwater and treated wastewater.

[80] UNESCWA (2021). Multidimensional poverty in Lebanon (2019-2021). E/ESCWA/CL3.SEP/2021/POLICY BRIEF.2

For an overview of the main climate change issues and needs in target areas in Lebanon see table 1.

Table 1: overview of main climate change issues / vulnerabilities and needs in target areas in Lebanon

Municipality	Population	Main climate change impacts / Hazards (exposure)	Effects on communities and vulnerable groups (sensitivity)	Barriers to adapt (adaptive capacity)	Priority resilience building interventions	Issues and concerns (identified through consultations) and response needs
Bar Elias	Total population count: 69,124 Women: 35,514 Youth: 3,802 Syrians: 39,124	- Drought - Flooding - Extreme heat	Drought: - Water Scarcity in urban areas - Add financial burden to families due to lack of adequate drinking water - Agriculture/ crop failure with significant impact on Syrian DPs Extreme heat: - Increase in agricultural water demand - Increase of pests and other insects which damage crops and bring about diseases - Change in agricultural patterns and evident decline in livestock production - Low air quality resulting in heightened level of pollutants Flooding: - Loss of shelter and safety risks for vulnerable groups (mainly displaced persons, women, elderly and children) - Limited mobility - Spread of diseases - Leachate seepage	- Lack of adequate water supply - Lack of funding - Lack of capacity - Lack of awareness about water scarcity and water conservation strategies. - Absence of legislations to cope with climate change - Legal restrictions on supplying piped water to ITS - Poverty of 26 percent	- Clean water, e.g. through rooftop rainwater harvesting and reuse and permaculture - Awareness on water scarcity and water conservation strategies - Guidelines including Climate Change Adaptation measures, land use and water scarcity issues	- Harvested water can be polluted (need quality control and awareness) - Harvested and treated stormwater can only be used for domestic reuse and irrigation purposes - Maintenance of rainwater harvesting system (need maintenance plans) Service provision disparities - Service provision disparities - Resistance on the use of harvested/treated water due to lack of awareness - Operation and maintenance (first year guidelines followed thereafter by continued routine guidelines)
Hazerta, El Marj, Saadnayel ,Taanayel, Taalabaya , Terbol, Ferzol	Total population count: 98,507 Women: 49,301 Youth: 5,454 Syrians: 55,827	- Drought - Flooding - Extreme heat	Drought: - Water Scarcity in urban areas - Add financial burden to families due to lack of adequate drinking water - Agriculture/ crop failure with significant impact on Syrian DPs Extreme heat: - Increase in agricultural water demand - Increase of pests and other insects which damage crops and bring about diseases - Change in agricultural patterns and evident decline in livestock production	- Lack of adequate water supply - Lack of funding - Lack of capacity - Lack of awareness about water scarcity and water conservation strategies. - Absence of legislations to cope with climate change - Legal restrictions on supplying piped water to ITS	- Clean water, e.g. through rooftop rainwater harvesting and reuse - Awareness on water scarcity and water conservation strategies - Guidelines including Climate Change Adaptation measures, land use and water scarcity issues	- Harvested water can be polluted (need quality control and awareness) - Harvested and treated stormwater can only be used for domestic reuse and irrigation purposes - Maintenance of rainwater harvesting system (need maintenance plans) - Service provision disparities - Resistance on the use of harvested/treated water due to lack of awareness - Lack of commitment and financing to apply

			- Low air quality resulting in heightened level of pollutants Flooding: - Loss of shelter and safety risks for vulnerable groups (mainly displaced persons, women, elderly and children) - Limited mobility - Spread of diseases - Leachate seepage			adaptive measures to Climate Change
Zahle	Total population count: 184,332 Women:94,705 Youth: 10,140 Syrians: 104,332	- Drought - Flooding - Extreme heat	Drought: - Water Scarcity in urban areas - Add financial burden to families due to lack of adequate drinking water - Agriculture/ crop failure with significant impact on Syrian DPs Extreme heat: - Increase in agricultural water demand - Increase of pests and other insects which damage crops and bring about diseases - Change in agricultural patterns and evident decline in livestock production - Low air quality resulting in heightened level of pollutants Flooding: - Loss of shelter and safety risks for vulnerable groups (mainly displaced persons, women, elderly and children) - Limited mobility - Spread of diseases o Leachate seepage	- Lack of money to buy drinking water - Lack of adequate water supply - Lack of funding - Lack of capacity - Lack of awareness about water scarcity and water conservation strategies. - Absence of legislations to cope with climate change - Legal restrictions on supplying piped water to ITS - Poverty of 38 percent - 45% of Lebanese householdshave insecure food consumption where the majority of the population live from agriculture (LCRP 2019)	- Clean water for agriculture, e.g. through rooftop rainwater harvesting and reuse and through treated water from upgraded WWTP (partial diversion of the treated discharge into an open canal) - Reduced agricultural water losses through water efficient drip irrigation - Awareness on water scarcity and water conservation strategies - Guidelines including Climate Change Adaptation measures, land use and water scarcity issues	- Treated wastewater will only benefit farmers - Harvested water can be polluted (need quality control and awareness) - Harvested and treated stormwater can only be used for domestic reuse and irrigation purposes - Maintenance of rainwater harvesting system (need maintenance plans) - Service provision disparities - Resistance on the use of harvested/treated water due to lack of awareness - Unwillingness to pay tariffs for wastewater collection and treatment, and for sludge treatment and reuse

Based on UN-Habitat vulnerability assessment conducted in target area (through consultations). Details of surveys and consultation outcomes can be shared on request

Jordan

Irbid is located in Jordan's wet region the total annual rainfall in this region varies between 400 and 600 mm while Mafraq on the other hand is located within the dry region in the east, where average rainfall annually varies between 100 and 300 mm (see figure 6). The total populations and disaggregated data and an overview of climate change issues and adaptation needs for each municipality are shown in table 2.

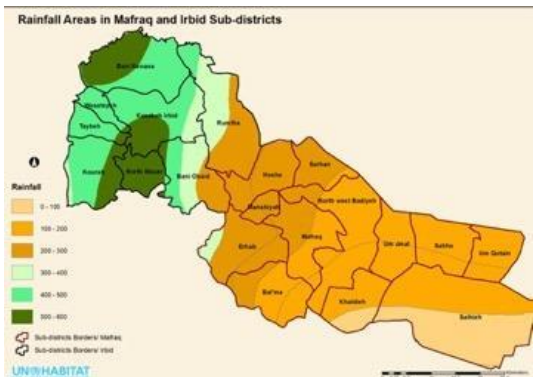
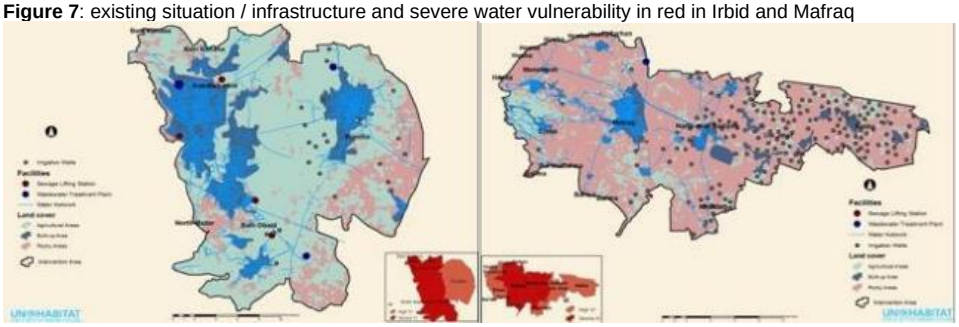


Figure 6: annual average rainfall in target areas

According to focus group consultation and key informant interviews conducted within the target areas in Jordan (see section II.I), the increase in temperature and the decline in rainfall which leads to drought are two of the most hazardous climate change impacts in both Mafraq and Irbid. This confirms the outcomes of Jordan's Third National Communication[81] to the UNFCCC based on long historical data obtained from Jordan Metrology Department (JMD) that predicted a serious decline in precipitation trends, both the Mann-Kendall rank trend test and linear regression trends indicate that the annual precipitation tends to decrease significantly with time at a rate of 1.2 mm per year, and according to the results of the Second National Communitation[82] (SNC) by 2070-2100, the cumulated precipitation could likely decrease by 15%. TNC findings also show significant increase in the temperature, the mean, maximum and minimum air temperature tends to increase significantly by 0.02, 0.01, and 0.03 °C/year, respectively. For the Water Sector in particular, results revealed that based on the climate trends analysis using CORDEX and RCP 4.5 and 8.5 the main climate hazards that the water sector faces in Jordan are temperature increases, increased incidents of drought, increased evaporation, and precipitation decreases. The TRAIN model suggests up to a 50 per cent decrease in water availability in northwest Jordan (HadCM3, A1B scenario, 2021–2050 compared with 1961–1990 control period). An overall increase in local and regional irrigation demand has serious implications for Jordan since further stress will be put on the groundwater resource. While on the other hand, in some target areas, flooding has also been pointed out as a major hazard. This is also in line with the predictions of a higher intensity of flooding in Jordan due to climate change[83].

Figure 7: existing situation / infrastructure and severe water vulnerability in red in Irbid and Mafraq

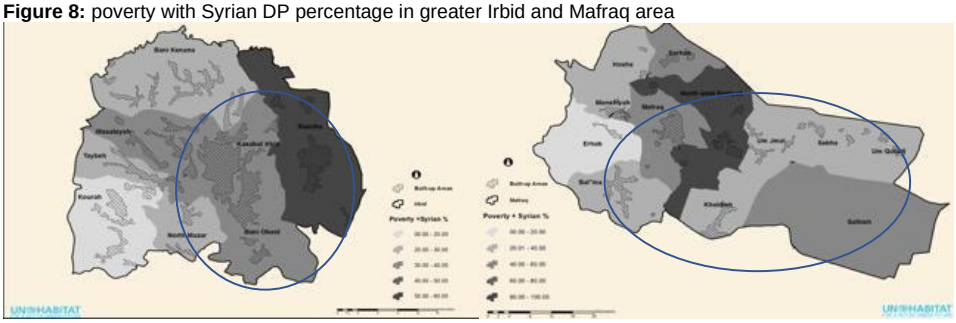


[81] Third National Communication Report of Jordan to UNFCCC (2014), UNDP and Jordan Ministry of Environment.

[82] Second National Communication (SNC) to UNFCCC (2009). UNDP and Jordan Ministry of Environment.

[83] Jordan Ministry of Water and Irrigation: Climate Change Policy for a Resilient Water Sector, 2016, page 3

Figure 8: poverty with Syrian DP percentage in greater Irbid and Mafraq area



Besides natural population growth, the target areas selected suffer from increased water demand mainly due to the influx of Syrian DPs, impacts of climate change are projected to raise water deficits in Jordan particularly in the northern part where the influx of refugee has worsen the situation.Syrian DPs live in the same urban areas as Jordanians and so are subject to the same impacts. However, Syrian DPs have higher vulnerability due to the fact that they are likely to have a lower net income than the average Jordanian family. In agricultural areas, the livelihood of Syrian DPs heavily depends on job opportunities at Jordanian farms and so are affected by any decline or change in agricultural activities.

Figure 7 shows the build-up area in greater Irbid and Mafraq with existing water infrastructure. In red, the area with severe water vulnerability (according to UNICEF) is shown. Figure 8 shows the share of poverty with Syrian DP percentage in greater Irbid and Mafraq. The cities fall in the category 30-40 percent poverty / DPs.

Mafraq Governorate:

Qasabit Al Mafraq: The two most problematic climate change hazards identified throughout the focus group discussions were; flooding and drought. The area has been experiencing an increase in the frequency of flood occurrence and decline in precipitation levels. Which have led to a decline in water table and groundwater level, resulting in water scarcity. Water is being pumped to households once a week and houses with small tanks do not store enough water. Flooding and water scarcity have an adverse effect on residents of the area, floods damage many households causing displacement, forcing absence from workplaces and schools which affects families income. An increase in the number of insects and rodents is prevalent. Water scarcity adds a financial burden to families that resort to purchasing water, especially Syrian families who usually have less net income than Jordanian families. It also causes psychological and physical stress to stay-at-home moms who stay up late at night to make use of the water supplied once a week in laundry, cleaning and other household purposes. Drought has caused a decline in agricultural and livestock production in the surrounding areas, affecting the livelihoods of Jordanian farmers and Syrian DPs working on farms.

Al Ghadeer Al Abiad: Farmers identified drought and extreme weather (heat and cold) as the two most significant climate change hazards in the past 10 years. The change in the patterns of rainfall results in deteriorating cultivated crops such as wheat and barley and forcing farmers to shift from rain fed to irrigated agriculture. According to farmers, reclaimed water is becoming more expensive. Extreme weather in summer and winter has damaged crops and caused economic losses to farmers. Farmers can no longer rely on rain fed agriculture to make a living. Due to water scarcity, farmers are becoming more dependent on reclaimed water . Farmers are forced to receive reclaimed water even at times when irrigation isn't that high (e.g. during rainy season) reclaimed water cannot be stored for more than a few days as its quality will extremely deteriorate resulting in serious health risks. Livelihoods of Syrian DPs who work on Jordanian farms are also negatively affected by these impacts. Less farmers are required due to the decline in livestock and agricultural production caused by drought.

Irbid Governorate:

Qasabit Irbid: Flooding and drought are the two most hazardous climate change impacts affecting the area. Increased frequency of flooding- which occurs mainly in winter- over the past few years. drought caused by decline in rainfall and water scarcity caused a shortage in supplied drinking water. Floods

impose safety risks and limits the mobility of residents, specifically; children, disabled and elderly. It may result in displacement among the population living in wadi (valley) areas in addition to damage to houses and infrastructure. Flooding increases the number of insects and rodents which increased diseases among children. Women and children mainly remain at home during flooding. Drought has severely affected households, exacerbated by Syrian DPs influx, water scarcity caused a shortage in supplied drinking water adding a financial burden to families as they need to purchase drinking water from the private market, which is not subsidised. . It also causes psychological and physical stress to stay-at-home moms who stay up late at night to make use of the water supplied once a week in laundry, cleaning and other household purposes. Drought also caused a shrinkage in the agricultural area and changes in the vegetation cover. For example, the supply of olive oil has dramatically decrease and with much higher prices.

Bani Obead: Drought, extreme heat and flooding have been identified as the most hazardous climate change impacts in the target area.
Water scarcity caused a shortage in supplied drinking water, drought causes shrinkage in agricultural area and flooding causes safety hazards. Exacerbated by influx of Syrian DPs, water scarcity caused a shortage in supplied drinking water adding a financial burden on families that resort to purchasing drinking water from the private market which is not subsidised.It has also affected personal hygiene especially among children. Drought also caused a shrinkage in the agricultural area. The agricultural pattern has also changed due to increased temperature with a decline in wheat and clover. Temperature which used to reach 35°C can now reach up to 45°C in summer according to the community members causing spread of mosquitos and emergence of diseases that are new to the area. Floods damage houses and infrastructure hindering mobility.

Ramtha: Drought and extreme weather (heat and cold) were identified as the two most significant climate change hazards in the past 10 years by local farmers. The preliminary predictions of the CROPWAT model suggest that, at Ramtha in northwest Jordan, the irrigation demand will increase from 62 to 132mm of water when growing vegetables under the A2 scenario for 2071–2100 using HadRM3 and an assumed irrigation efficiency of 70 per cent[84].

Water shortage at household level, farmers are more dependent on reclaimed water due to water scarcity, however reclaimed water is becoming more expensive. Drought has also caused a decline in food and water available for livestock production. Financial burden on farmers, as reclaimed water is increasing in price. Farmers are forced to receive reclaimed water in times that they do not need for irrigation (e.g. during rainy season) and they cannot store it for long as its quality will deteriorate, resulting in serious health risks. Women pointed out that lack of knowledge around permaculture techniques and greywater use in addition to lack of funding to install rainwater harvesting systems. Less farm workers are needed and for less number of days. In addition, extreme weather in summer and winter has damaged crops and caused economic losses to farmers. Livelihoods of Syrian farmers are also negatively affected by these impacts.

Jerash: Flooding and drought are the two most significant climate change hazards in Jerash. Poor water purification system, results in farmers receiving poor quality water. Reclaimed water that does not meet minimum health and safety standards pollutes the soil and groundwater. Drought and the decrease in precipitation as a result of climate change has an adverse effect on Jerash that depend highly on agricultural and livestock production. Farms are in critical conditions, livestock, olive and olive oil production have decreased, causing loss of jobs, this results in financial burdens to farmers. The quality of reclaimed water is deteriorating and becoming more expensive, as a result farmers in Jerash suffer from poor water quality and quantity causing a decrease human and land productivity. Moreover, water ponds result in potent smells that may cause disease. Syrian DPs that work on farms are also negatively affected by these impacts.

For an overview of the main climate change issues and needs in target areas in Jordan see Table 2.

[84]https://royalsocietypublishing.org/doi/pdf/10.1098/rsta.2010.0207

Table 2: overview of main climate change issues and needs in target areas in Jordan

Community	Population	Main climate change impacts / Hazards (exposure)	Effects on communities and vulnerable groups (sensitivity)	Barriers to adapt (adaptive capacity)	Priority resilience building interventions	Main issues and concerns (identified through consultations) and response needs (to be aligned with work Amal)
MUNICIPALITY						
Qasabit Mafraq (Mafraq)	**Total Number:** 124,479 **Syrian DPs**: 39,359 **Female:** 59,542 **Disabled:** NA	Flooding Drought	Flooding Safety risk due to flooding especially for women and children Damage to infrastructure and houses Households Displacement Spread of diseases among children and youth Limit children and parents mobility Drought Water Scarcity in urban areas Add financial burden to families due to lack of adequate drinking water Agriculture/ crop failure with significant impact on Syrian DPs	Lack of funding Lack of capacity Lack of awareness about water scarcity and water conservation strategies. Absence of legislations to cope with climate change Lack of adequate water supply for household purposes **Socio-Economic Data:** Poverty: 11.7% Poverty [+Syrian % of total]: 43.3% Water network coverage (# of subscribers/HHs): 67.4% % of HH not connected to the network: 32.6% Needed Water [M3]: 5,910 VI attributed to Jordanian: 68% VI attributed to Syrian refugees: 32% Water Vulnerability: **Severe Vulnerability** Number of Agricultural Holdings:3,618 Area of Agricultural Holdings (Donum):68,544	Greywater reuse system in schools and mosques Rooftop rainwater harvesting system at municipal building, schools and mosquesUrban master plan at with CC and gender mainstreamed	Some cultural and religious resistance to greywater reuse (awareness through religious leaders) Service provision disparities Potential conflicts over the provided services due to land ownerships Wastewater polluting the soil. Having microorganisms in the treated water
Al-Ghadeer Al-Abiad (Mafraq)	**Total Number:** 1,661 Female: 814 Disabled: NA Syrian DPs: 271 <14: 680 15-24: 338 25-60: 658 >60: 76	Drought Extreme Weather (heat and cold)	Drought Less water available for agriculture Changing crop patterns Decline in livestock production Extreme heat and cold Crop failure	Lack of funding and high prices of reclaimed water Lack of capacity to use new agricultural techniques Absence of legislations to cope with climate change	Enhance the quality of treated wastewater from Al Mafraq WWTPReduced agricultural water losses through water efficient drip irrigation	Land availability as farmers prefer to use the whole land for cultivation. Non-equal access to provided service. Water shares are not evenly distributed among farmers (inclusive planning)

Qasabit Irbid (Irbid)	**Total Number:** 739,212 **Jordan Population:** 573,369 **Syrian DPs**: 165,843 **Female:** 355,898 **Disabled:** NA	Flooding Drought	Flooding Safety risks especially for displaced, elderly women and children Displacement Damage to infrastructure and houses Increased diseases Drought Urban water scarcity Add a financial burden on families due to lack of adequate drinking water Agricultural decline with significant impact on Syrian DPs	Lack of funding Lack of awareness Lack of space in wadis to provide buffer zone in flooding Absence of legislations to cope with climate change **Socio-Economic Data:** Poverty: 9.9% Poverty [+Syrian % of total]: 32.3% Water network coverage (# of subscribers/HHs): 75.1% % of HH not connected to the network: 24.9% Needed Water [M3]: 38,688 VI attributed to Jordanian: 78% VI attributed to Syrian refugees: 22% Water Vulnerability: **Severe Vulnerability** Number of Agricultural Holdings:7,879 Area of Agricultural Holdings (Donum):55,433	Rooftop rainwater harvesting in municipal building, residential building, schools and mosques Greywater treatment and reuse in schools and mosques Urban master plan with CC and gender mainstreamed	How to use apartment blocks for water harvesting
Bani Obead (Irbid)	**Total Number:** 204,313 **Jordan Population:** 155,739 **Syrian DPs**: 48,574 **Female:** 100,351 **Disabled:** NA	Drought Extreme heat Flooding	Drought Urban water scarcity Add a financial burden on families due to lack of adequate drinking water Personal Hygiene among children Decline in agricultural area Extreme heat Increased diseases Change of agricultural patterns Flooding Safety risks among displaced, elderly, women and children Damage to houses and infrastructure Affect mobility of women and children	Lack of funding Lack of awareness about water scarcity and water conservation strategies. Outdated water supply networks causing inadequate water supply for household purposes Absence of legislations to cope with climate chang **Socio-Economic Data:** Poverty: 9.9% Poverty [+Syrian % of total]: 32.3% Water network coverage (# of subscribers/HHs): 75.1% % of HH not connected to the network: 24.9% Needed Water [M3]: 38,688 VI attributed to Jordanian: 78% VI attributed to Syrian refugees: 22% Water Vulnerability: **Severe Vulnerability** Number of Agricultural Holdings:7,879 Area of Agricultural Holdings (Donum):55,433	Rooftop rainwater harvesting Greywater treatment and reuse in schools and mosques	Lack of participation in planning of project/ interventions. Safety during construction. Service provision disparities Potential conflicts over the provided services due to land ownerships. Untreated groundwater leakage and water salinity.

Ramtha (Irbid)	**Total Number:** 238,502 **Jordan Population:** 170,196 **Syrian DPs**: 68,306 **Female:** 114,571 **Disabled:** NA	Drought Extreme Weather (heat and cold)	Drought Less water available for agriculture with significant impact on Syrian DPs Urban water scarcity Decline livestock production Irrigation demand will increase from 62 to 132mm of water when growing vegetables under the A2 scenario for 2071–21 Extreme heat and cold Crop failure	Lack of funding for farmers to adapt Lack of awareness of and financial capacity to invest in permaculture Lack of capacity to use new agricultural techniques **Socio-Economic Data:** Poverty: 25.1% Poverty [+Syrian % of total]: 53.7% Water network coverage (# of subscribers/HHs): 35.8% % of HH not connected to the network: 64.2% Needed Water [M3]: 16,439 VI attributed to Jordanian: 71% VI attributed to Syrian refugees: 29% Water Vulnerability: **High Vulnerability** Number of Agricultural Holdings:6,515 Area of Agricultural Holdings (Donum):91,320	Permaculture at Local University / Research Centre~~JUST~~ Rainwater harvesting at schools Greywater treatment and reuse at schools	Increased water expenses Untreated groundwater leakage and water salinity
Jerash	**Total Number:** 207,97 **Jordan Population:** 197,704 **Syrian DPs**: 10,293 **Female:** 99,879 **Disabled:** NA	Drought Flooding	Drought Less water available for agriculture Decline in livestock production	Lack of funding and high prices of reclaimed water Lack of capacity to use new agricultural techniques Absence of legislations to cope with climate change **Socio-Economic Data:** Poverty: 20.3% Poverty [+Syrian % of total]: 25.2% Water network coverage (# of subscribers/HHs): 63.0% % of HH not connected to the network: 37.0% Needed Water [M3]: 7,809 VI attributed to Jordanian: 95% VI attributed to Syrian refugees: 5% Water Vulnerability: **High Vulnerability** Number of Agricultural Holdings:8,398 Area of Agricultural Holdings (Donum):98,099	Enhance the quality of treated wastewater from Al Maerad WWTPReduced agricultural water losses through water efficient drip irrigation	Non-equal access to provided service. Water shares are not evenly distributed among farmers The lack of distribution of water pipes to farmers Wastewater polluting the soil. Not cleaning the canals between the station and the flood stream.

Based on UN-Habitat vulnerability assessment conducted in target area (through consultations). Details of surveys and consultation outcomes can be shared on request

Assessment of sensitivity showed that the average sensitivity level is 3.71. Adaptation strategies and measures suggested for the water sector in the TNC are: Rainwater harvesting, Wastewater treatment, Desalination, Increasing Efficiency of irrigation technologies, Grey water Reuse, Public awarenes5 out of the 7 adaptation measures advanced to water sector in Jordan are covered in this proposal.

Project Objectives

The overall aim of this project is to better respond to climate change impacts and vulnerabilities in the context of the Syrian crisis in Jordan and Lebanon. This is done by demonstrating what concrete adaptation measures (see comp 3) respond to the needs of both DPs and host communities, and especially women and youth, while avoiding any tension over resources and employment opportunities.

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 non-conventional and more sustainable sources, incl. rainwater harvesting and the reuse of treated waste water (see comp 3).

The project will promote the replication and upscaling of the demonstrated techniques and approaches, also beyond Jordan and Lebanon (see comp 4), and to demonstrate how water resources can be assessed, planned and managed more efficiently at the municipal level (i.e. establish urban-rural linkages) and sustainably (by mainstreaming climate change and gender in municipal master plans) (see comp 1).

During project preparation, DPs in the target areas have been identified as the most vulnerable group due to their socio-economic situation and their dependence on often water-vulnerable sectors, especially the agriculture sector. However, to avoid supporting increased tension between DPs and host communities, the project also targets host community members. Assessment and planning processes under component 1 and capacity building activities under component 2 will target both DP and host community groups to avoid and even reduce any tension.

Table 3: project objectives and sub-objectives

Objectives	Development approach applicable to climate change and DPs crisis context
Overall objective: Increasing the resilience of both displaced persons and host communities to climate change-related water challenges in Jordan and Lebanon.	
Sub-objectives:	
Increasing the resilience of municipal governments: Manage urban risks and vulnerabilities in the context of climate change, esp. water scarcity challenges, and urban (population) growth, incl. from DPs migration	**Support addressing regional DPs crisis and climate change challenges at the municipal level:** through developing a comprehensive and integrated development response approach (see comp 4)
	Forward-looking / pro-active urban spatial planning and sustainable water management: planning for future urban (population) growth and climate change impacts in an integrated manner (see comp 1)
Increasing the resilience of citizens (DPs and host communities): Improve awareness, ownership and capacities to respond to climate change, incl. to operate, maintain and replicate resilient water harvesting, supply and irrigation systems	**Citizen engagement:** minimizing risks of social tensions through citizen engagement and enhancing opportunities for social exchange between host-city inhabitants and DPs (especially women and youth) (see comp 1 and 2)
	Awareness, capacity / skill building support: providing support such as skill building and training to build people's self-reliance, especially regarding water (targeting especially women and youth) (see comp 2)
Increasing the adaptive capacity of the water sector: Expand unconventional water harvesting, supply and irrigation options, using innovative and replicable techniques suitable for the context	**Settlement upgrading**: Area-based (i.e. urban – rural linkages) approach for increasing the resilience of water supply services (see comp 1)
	Assets, services and livelihood security projects: Expanding and strengthening water infrastructure and services which are climate change resilient and sustainable (and capture best practices) (see comp 3)
Improving knowledge and policies and regulations to increase urban resilience in the region: Project KM and replication, incl. development of regional urban risks and vulnerabilities management model in the context of climate change and urban (population) growth (incl. from DPs migration)	**Improvement of knowledge, policies regulations in the region:** by developing a 'regional' approach model for managing urban risks and vulnerabilities in the context of climate change and urban (population) growth (also because of high influx of DPs), especially for type 2 cities, including gender considerations + sharing lessons

*****In line with World Bank et all (2017, policy note September 14): Refugees in the middle east. Bringing an urban lens to the forced displacement challenge.

Project Components and Financing

Table 4: project components and financing

Project Components	Expected Outcomes	Expected Outputs	Countries	Amount (US$)
1. Manage urban risks and vulnerabilities in the context of climate change, esp. water scarcity challenges, and urban (population) growth, incl. from DPs migration	1.1.1. Strengthened municipal institutional capacity to manage climate change and DP crisis related urban water scarcity challenges by mainstreaming these aspects into spatial strategies + developing action / investment plans and guidelines (with identified solutions) to use water most efficiently within municipal boundaries (in line with AF outcome 2)	1.1. Territorial planning and development strategy / guidelines with CC and gender mainstreamed in Lebanon 1.2. Urban master plans at municipal level with CC and gender mainstreamed in Lebanon 1.3. Urban master plans at municipal level with CC and gender mainstreamed in Jordan Above strategies and plans including mapped current and future water demand needs and supply options considering esp. climate change, urban growth and agriculture evolution + action / investment plans (incl. identified solutions) to use water most efficiently within municipal boundaries Above also includes workshops / trainings targeting esp. women and youth (both host communities and DPs) to develop the plans	Lebanon Lebanon Jordan	249,000 530,000 562,000 T: 1,341,000
2.Improve awareness, ownership and capacities to respond to climate change, incl, to operate, maintain and replicate resilient water harvesting, supply and irrigation systems	2.1.1.Strengthened DPs and host community awareness and ownership of CC adaptation measures + capacities strengthened to operate, maintain and replicate proposed adaptation measures (in line with AF outcome 3 and 8)	2.1. Community organisation, awareness and capacity building + operation, maintenance and replication/ upscaling plans for concrete adaptation output 3.1 2.2. See below for output 3.2. 2.3. See below for output 3.3. 2.4. See below for output 3.4. 2.5. See below for output 3.5. 2.6. See below for output 3.6. 2.7. See below for output 3.7. 2.8. See below for output 3.8 2.9. See below for output 3.9 For more details see section II.A	Lebanon & Jordan	195,400 139,200 234,000 ~~163~~173,200 16,000 ~~142,100~~127,100 259,000 314,600~~351,716.36~~ 418,171 T: 1,87~~681,~~671 ~~1,918,787.36~~
3.Expand unconventional water harvesting and supply options, using innovative and replicable techniques	3.1.1. Increased adaptive capacity within the water sector through resilient and sustainable water harvesting, supply and irrigation options, using innovative and replicable techniques suitable for the context and benefitting vulnerable groups (in line with AF outcome 4, 6 and 8	3.1. Rooftop rainwater harvesting in Lebanon 3.2. Rooftop rainwater harvesting in Jordan 3.3. Greywater treatment and reuse in Jordan 3.4. Efficient treatment and reuse of wastewaterin Lebanon 3.5. Efficient treatment and reuse of wastewater in Jordan 3.6. Water-use-efficient irrigation of treated wastewater in Lebanon 3.7. Water-use Efficient irrigation of treated wastewater in Jordan 3.8. Permaculture demonstration –closed loop water system in Jordan 3.9 Permaculture demonstration – closed loop water system in Lebanon For more details see section II.A	Lebanon Jordan Jordan Lebanon Jordan Lebanon Jordan Jordan Lebanon	~~867,262~~460,776 836,820 843,112 ~~846,120~~2,246,556 1,053,332 ~~988,950~~ 804,400 ~~346,929.64~~ 384,046 885,725 T: 7,514~~509~~,767 ~~7,472,650.64~~

Commented [LAE1]: Output 3.6 is deleted

4. Project KM and replication, incl. dev. of regional urban risks and vulnerabilities management model in the context of climate change and urban (population) growth (incl. from DPs migration)	4.1.1. Strengthened (inter)National institutional capacity to manage climate change and DP crisis related urban water scarcity challenges, including lessons learned collected and shared regionally (in line with AF outcome 3 and 8)	4.1. Regional / international KM with focus on sharing project lessons and replication 4.2. Jordan and Lebanon KM with focus on project progress, best practices and lessons learned 4.3. Sub-national KM and Regional' urban risks and vulnerabilities assessment, planning and management approach model for type 2 cities 4.4. Incentive mechanism (financial) and regulatory framework to replicate and upscale rainwater harvesting activities	Lebanon & Jordan (and other countries in the region that are part of ESCWA	280,000 437,800 165,000 40,362 T: 923,162
5. Total components				11,655,600
6. Project/Programme Execution cost				1,223,210
7. Total Project/Programme Cost				12,878,810
8. Project/Programme Cycle Management Fee charged by the Implementing Entity				1,094,699
Amount of Financing Requested				**13,973,509**

Projected Calendar

Table 5: Project calendar

Milestones	Expected Dates
Start of Project/Programme Implementation	October 2020
Project/Programme Closing	April 2025
Terminal Evaluation	January 2025

PART II: PROJECT / PROGRAMME JUSTIFICATION

A. Project components

To achieve the overall project objective 'Increasing the resilience of both displaced persons and host communities to climate change-related water challenges in Jordan and Lebanon' the projects' 'core' entails a set of 'concrete' adaptation actions, using innovative and replicable techniques that aim to reduce the demand of unsustainable water sources such as (polluted) groundwater, while increasing water supply options from non-conventional and more sustainable sources, such as rainwater harvesting and the reuse of treated waste water at municipal and community level (component 3). To ensure local ownership and capacity to 'manage' these 'concrete' adaptation actions and to avoid social tension of proposed project benefits, measures to inclusively plan, operate, maintain and replicate the actions are proposed at the community level (component 2). To better manage urban risks and vulnerabilities, especially related to the water sector, assessment and planning capacities will be strengthened at the municipal level (component 1). Based on above, a model to better manage urban risks and vulnerabilities suitable for a high DPs influx context area (in type 2 cities) will be developed, taking into account the impacts of climate change, especially on water resources. This model is relevant for the Mafraq region as well as areas with a similar context and will therefore be shared in the region (component 4). For detailed maps of target areas and conceptual drawings of concrete interventions, see annex 2. For details of all activities, see budget notes in annex 6.

The objectives of the proposal are in line with national priorities (see section II.D) and Adaptation Fund outcome areas, which resulted in the following components:

Component 1: Increasing the resilience of municipal governments: Manage urban risks and vulnerabilities in the context of climate change, esp. water scarcity challenges, and urban (population) growth, incl. from DPs migration (in line with AF outcome 1 and 2).

This component will focus on strengthening municipal institutional capacity to manage climate change and DP crisis especially related to urban water challenges (i.e. water scarcity / droughts and floods) by mainstreaming these aspects into spatial strategies / urban master plans + developing action / investment plans and guidelines (with identified solutions) to use water resources most efficiently within municipal boundaries. Thus, through this project, the municipal plans will be used as tools to identify and manage climate change risks / vulnerabilities and identify additional adaptation options. Municipal officers will be trained to collect needed data and conduct climate change vulnerability assessments as integral part of developing these strategies / plans; thus, to manage related urban risks and vulnerabilities.

Why is this needed: As tensions between DPs and host communities, especially around scare resources and jobs, are increasing, inclusive community-level planning processes are needed to support social exchange and to ensure equal benefits to interventions. However, in both Jordan and Lebanon, there is limited capacity at the municipal/ community level to respond to climate change and to manage water in an efficient, comprehensive and forward-looking way. One of the reasons is the lack of coordination between different authorities (i.e. municipalities, water establishments, ministry of agriculture) and disciplines (i.e urban planners, water engineers and agriculture engineers), which all produce their separate plans, making planning often not inclusive and efficient. Besides that, in both Jordan and Lebanon, most of the water management is the responsibility of national and governorate-level authorities. At this level, the focus is still very much on extracting water from conventional sources, especially groundwater, which is overexploited and increasingly polluted and current demand and supply focused, with limited consideration of climate change impacts and population growth and migration trends. However, municipalities are responsible for (i.e. mandated to) managing non-conventional water sources within their boundaries, including storm/rain-water, which sometimes result in floods, which opens up opportunities to plan and implement climate change adaptation options, such as rainwater harvesting and flood reduction interventions, in an inclusive way. By understanding the available water resources, especially non-conventional storm/rain sources, now and in the future, municipal planners can manage water more efficiently for urban and rural use and to reduce flood risks. This can be planned through the development of municipal plans that consider climate change with a focus on water challenges. These plans will complement regional (district) and national water master plans by reducing pressure on conventional water resources (groundwater). As both countries are currently developing national urban policies with the aim of empowering cities and expanding their mandates (besides laws described below), component 1 is forward-looking with the purpose of building the capacities of the cities and informing their water-climate related decision-making, through the urban observatories. Once drafted, urban policies are officially adopted, expanding the responsibilities of the municipalities.

In Jordan, according to the draft Local administration law, municipalities are fully responsible for managing storm/rainwater and floods within their boundaries, and for coordinating with the concerned authorities in managing the distribution of water among the population, organizing its distribution, participating in identifying water network and working to prevent pollution of springs, wadis and wells. Municipalities are also responsible for coordinating with concerned authorities on establishing wastewater networks.

In Lebanon, according to the Municipal Law 118, municipalities are also responsible for managing storm/rainwater and floods within their boundaries. At the level of permits, Municipalities have a major and decisive role in approving or rejecting any permit that does not abide by the set municipal zoning conditions[85]. This law allows, through the existing municipal authority, applying adequate climate planning. In the project target area, the Bekaa region, a high coordination mechanism is being established between the Bekaa Water Establishment (responsible for water-related utilities and resources at the district level and the municipalities that fall under the district's limits.

In Jordan, the current municipal master plan for Irbid was developed before the Syrian crisis and is outdated. In Mafraq, no master plan exists. In Lebanon, the same is the case for the municipalities surrounding Zahleh. The process of formulating strategies / plans will help the target municipalities to identify medium and long-term adaptation needs and to develop strategies to get these funded.

This is very timely as this project will build on initiatives that are giving municipalities the mandate and technical units to assess and manage climate change data and integrate this in municipal plans:the

[85]The Municipal zoning conditions are approved by the Directorate General of Urbanism – DGU (functions under the Ministry of Public Works - MoPW) and the Ministry of Interior and Municipalities (MoIM).

development of National Urban Policies in both Jordan and Lebanon (as mentioned above, see also section F), in which municipalities are urged to develop their local level plans and mainstream climate change in their planning processes, as well as the set-up of Urban Observatories (supported by CVBD (see section F), which is a mechanism to manage urban data and inform decision-making at the national level, including for climate change data with a National Observatory.

Structure and functioning of the urban observatories

As per UN-Habitat Lebanon's previous "Setting Up Local Urban Observatories in Lebanon" partnership agreement for a local Urban Observatory (LUO) could be defined as: "a local network of stakeholders responsible for producing, analysing and disseminating data on a meaningful set of indicators that reflects collectively prioritized issues. Data and information resources produced by the local network are used to support decision making and the formulation of better-informed policies. A Local Urban Observatory is therefore a focal point for territorial monitoring at the local or national scale." Local urban observatories are typically housed in an existing city or town department (Union of the Municipalities). They serve to produce manage and analyse data on the performance of a group of municipalities on key urban indicators and other thematic issues relevant to both local decision-making and global monitoring. This data analyses can be used to develop climate change vulnerability / hazards (droughts; water scarcity; floods) hotspot / risks maps (current and projected) and to prioritise adaptation measures (based on impacts / feasibility analysis). Local urban observatories share common aims:

- To create sustainable urban monitoring systems in support of local planning and management processes, linking data to policy
- To strengthen local capacity for the development and use of urban indicators that facilitate the collection of disaggregated data at city and sub-city levels;
- And to promote local ownership of urban indicator systems and cultures of monitoring and assessment in the urban sector

Climate change data available: In both Jordan and Lebanon, climate change data is collected and managed through national observatories. Sources of data are a combination international, national and local sources, including ESCWA / RICCAR. Besides that, climate change data and vulnerability assessment data, also at the local scale has been provided through multiple plans, incl. e.g. TNCs.

Climate change data missing: recurrent collection and management of climate change data in target municipalities, esp. Mafraq and municipalities surrounding Zahle.

What data will be collected, processed and analysed and by whom: available data for target municipalities and new climate scenario and vulnerability assessments. The data will be analysed by the to-be-strengthened/built by this project Urban Observatory Division in the target Municipalities as part of their business as usual roles (day-to-day work). Staff of such to-be-strengthened/built by this project Urban Observatory Division will have their capacities strengthened/built by this project to be in charge of coordination mechanism between municipal level and national government level on data and planning. In Jordan, two urban observatories will be established and in Lebanon one, covering Zahle and surrounding municipalities.

The project execution partner UNESCWA in cooperation with the Regional Initiative for the Assessment of Climate Change Impacts on Water Resources and Socio-Economic Vulnerability in the Arab Region (RICCAR) is currently generating six dynamically downscaled regional climate projections for the 'Mashreq domain' at the scale of 10 km2 through the end of the century for RCP 8.5), including for the project target areas. The projections will also be bias-corrected for use in water-related assessment (e.g., those related to water availability, runoff, groundwater recharge, agricultural productivity, etc.).This information can be used to assess water availability, incl. groundwater recharge in the Bekaa or northern Jordan, its implications for vulnerability and how to respond to this in the target areas at district / municipal level.

The municipal-level climate change vulnerability analysis will focus on identifying the risks and vulnerabilities related to water challenges (i.e. water scarcity / droughts and floods risks) and the implications for this on water availability and access, the built environment, people and water dependent livelihoods (especially agriculture) at the municipal level. This will include collecting some municipal level data (see data gaps table below) for which a budget is allocated (assessment and analysis under outpust

1.2. and 1.3. – see budget notes). The urban observatories' staff will be trained to collect this data and conduct the vulnerability analyses and developed risk / vulnerability hotspot maps.

Below an overview of what data is going to inform the municipal plans and in what format

Climate analyses	Scale, resolution and parameters	Format of analysis
1. Regional climate change scenario modelling for target areas	- Scale 10 km^2 through the end of the century for RCP 8.5. Specific areas, time period and time series (daily, monthly, yearly, 20-year increments) - Main parameters: climate, hydrology, vulnerability (with sub-indicators) - Climate change hazards: focus on water challenges (droughts / water scarcity and flood risks) - Bias-corrected for use in water-related assessment (water availability, runoff, groundwater recharge, agricultural productivity, etc.).	- Climate change risk and vulnerability maps and data set (NetCDF, user friendly GIS, SPSS; Excel) - Available from ESCWA without cost
2. Climate change vulnerability assessment in target areas	- Scale: Territorial (district/watershed-level), municipal, community-level data 1/2500 district level and 1/1000 municipal level - Climate change hazards: water challenges (droughts and floods) and the implications for this on water availability and access, the built environment, people and water dependent livelihoods (especially agriculture). - Main climate change related parameters: exposure, sensitivity, impacts, adaptative capacities	- Climate change risk and vulnerability maps and data set / profile (user-friendly GIS, SPSS, excel) - Feasibility analysis prioritised identified adaptation measures

Above will feed into spatial /urban master plans + developing action / investment plans (based on feasibility assessments) and guidelines(with identified solutions).

Data / info to be assembled / collected through the urban observatories and current gaps analysis

Data / info	Indicator	Sub-indicator	Available at target municipal level	
			Jordan	Lebanon
Regional climate modelling projections				
Climate	Change temperature	Annual; scale 10 km2	Yes (ESCWA / RICCAR)	
Hydrology	Change precipitation; change evapotranspiration	Annual; scale 10 km2	Yes (ESCWA / RICCAR)	
Vulnerability	Exposure hazards	Droughts / water scarcity. Bias-corrected for use in water-related assessment (water availability, runoff, groundwater recharge, agricultural productivity, etc.).	Yes (ESCWA / RICCAR)	
Climate change vulnerability target municipalities by urban observatories:				
Exposure	Change temperature	Annual	Yes (MoEnv; JMD)	Yes (MoE; MoA; LARI)
	Change precipitation	Annual	Yes (MoEnv; JMD)	Yes (MoE; MoA; LARI)
	Droughts / water scarcity	Annual	Yes, (MoEnv; MoWI)	Yes (MoEW; WE
Sensitivity	Demography / population trends	Poverty (% + location)	Yes (DoS)	Yes (UoM)
		Labour type / sector (% + location)	Yes (DoS)	Yes (LARI)
		Unemployment (%)	Yes (DoS)	Yes (OCHA; WB; MoSA)
		Displaced persons (% + location)	Yes (UNHCR)	Yes (UNHCR)
	Natural / environmental	Water resources / availability (volume source, stream flow / runoff; groundwater recharge)	Partly (MoWI)	Partly (MoEW; WE
		Soil erosion (% + location)	No	Partly (CNRS)
		Vegetation degradation (% + location)	Partly (MoA)	Yes (LARI; MoA)
		Salination (% + location)	No	Partly (MoEW; WE)
	Human made	Water network (location)	Yes (MoWI; YWC)	Yes (WE)

		Sewerage network (location)	Yes (MoWI; YWC)	Yes (WE)
		Agriculture (% + location)	Yes (MoA)	Yes (LARI; MoA)
		Solid waste (disposal kg + location)	Yes (Municipalities)	Yes (MoE; Municipalities
		Urban extend (coverage)	Yes (Municipalities remote sensing	Yes (Municipalities remote sensing
		Cultural heritage (locations)	Yes (MoTA)	Yes (MoC; Municipalities)
Potential impacts	Water resources / availability	Sources	Yes (MoWI)	Partly (MoEW-NWS)
		Stream flow / runoff	No	
		Groundwater recharge	No	
	Human settlements	Water access % and locations) % of housing units older than 30 years/total housing units	Partly (MoWI)	Partly (municipalities)
	People	Urban	Partly (municipalities)	Partly (municipalities)
		Rural / farmers	Partly (municipalities)	Partly (municipalities)
		Women	Partly (municipalities)	Partly (municipalities)
		Youth	Partly (municipalities)	Partly (municipalities)
		Displaced persons	Yes (UNHCR)	Yes (UNHCR)
	Agriculture	Crop failure (%)	No	Yes (LARI; MoA)
		Production change (%)	No	
Adaptive capacity	Knowledge and awareness	Population (%) trained to respond to cc hazard risks	No	No
	Technology	Water saving / efficient use / irrigation technology	No	Yes (UNDP; MoE; MoEW)
		Building codes applied	Yes, (Municipalities, MoLA)	No
	Institutions	Nr of human resources assigned to work on climate change	No	No
		Nr of development and risk reduction plans for area		
	Services and infrastructure	Water access / current and projected (%)	Partly (MoWI and YWC)	Partly (MoEW NWS)
		Nr of water companies rationing water during droughts		
		Assets / buildings protected from hazards (or reduced loss) (%)	No	No
	Economic resources	Allocated budget (total + %) climate change / risks reduction	No	No
	Equity (equal distribution / access)	Urban population	Partly (DoS; municipalities)	Partly (municipalities)
		Rural population / farmers	Partly (DoS; municipalities)	Partly (municipalities)
		Women	Partly (DoS; municipalities)	Partly (municipalities)
		Youth	Partly (DoS; municipalities)	Partly (municipalities)
		Displaced persons	Yes (UNHCR)	Yes (UNHCR)

With regard to the current status of such Urban Observatories, the project will resume previous efforts engaged in assessing the existing situation of the relevant organizational units at the three municipalities in terms of level of development and potential upgrading of what resembles the function of urban observatories[86]. A number of organizational units at the targeted municipalities partially, but at different development levels, practice what fully developed observatories do globally, where they also collect data other than climate data. The aim is for the data to be used by planning authorities, infrastructure operators,

[86]According to the definition provided by UN Habitat II, an urban observatory is a local network, which brings together different partners in charge of collecting, processing and disseminating data on different municipalities. It consists of a certain number of indicators on issues of sustainable development. It uses information gathered by local actors in order to help deciding upon and constructing sound and strong-willed policies. Hence, the urban observatory represents a central element in urban control on both international and national level.

emergency services and community groups to help them make better informed decisions about how conditions in the city could affect them. This will also inform planned concrete adaptation interventions in this project, especially related to specific vulnerabilities and detailed response designs. For an overview of possible concrete measures that could be taken as a result of municipal planning and an indication of the contribution to adaptation see Part II.D.

Component 2: Increasing the resilience of citizens (DPs and host communities): Improve awareness, ownership and capacities to respond to climate change, incl. to operate, maintain and replicate resilient water harvesting, supply and irrigation systems (in line with AF outcome 3)

This component will focus on strengthened DPs and host community's awareness and ownership of climate change adaptation measures + capacities strengthened to operate, maintain and replicate proposed adaptation measures, including skills building.

Why is this needed: To ensure sustainability of the proposed adaptation measures under component 3, communities need to 'own' the interventions and it needs to be clear how the proposed measures will be operated, maintained and replicated. Because there is a lack of capacities to do this at the community level, these capacities will be strengthened, as well as the awareness of adaptation options.

Above will be done by developing operation, maintenance and replication plans for proposed adaptation actions in a participatory way, including identifying responsibilities and maintenance budgets. Women and youth organization will be strengthened and trained to lead water harvesting interventions at home / in the settlement and to use and replicate techniques.

Component 3: Increasing the adaptive capacity of the water sector: Expand unconventional water harvesting, supply and irrigation options, using innovative and replicable techniques suitable for the context (in line with AF outcome 4 and 6).

This component will focus on increasing the adaptive capacity within the water sector through resilient and sustainable water supply, using innovative, climate change resilient water supply techniques, which are suitable for high DPs influx context and replicable and mostly benefit vulnerable groups, also through securing water-dependent livelihoods, especially in the agriculture sector. The purpose is to reduce the demand of unsustainable water sources such as (polluted) groundwater, while increasing water supply options from non-conventional and more sustainable sources, such as rainwater harvesting and the reuse of treated wastewater.

Why is this needed This is needed because of increasing water availability challenges in both Jordan and Lebanon, exacerbated by climate change and the limited options municipal governments have to respond to these challenges.

The proposed concrete adaptation measures all aim to harvest available water from non-conventional sources (rain and wastewater) and to treat and irrigate it as efficiently as possible. The proposed interventions include rooftop rainwater harvesting systems and water saving devices, greywater treatment and reuse systems and water saving devices, efficient treatment and reuse of waste water, water-use-efficient irrigation of treated wastewater systems and permaculture demonstrations - closed loop water systems.

These proposed measures were prioritised by the project steering committees (with representatives from different ministries and the target municipalities) and beneficiary communities (through consultations).

Rooftop rainwater harvesting systems will be established in municipal buildings, schools and mosques and residential buildings in the target areas in Jordan and Lebanon. Municipal buildings were selected as demonstration / awareness raising sites, while schools and mosques were selected because of high impact and awareness raising purposes, including through curriculum and religious leaders' speeches inputs (see linked component 2). Residential buildings were selected to test these systems in all possible buildings with the purpose to identify how the rainwater harvesting intervention can be scaled-up to a municipal or national programme. In Jordan, various ministries requested UN-Habitat (see section II.I) to set-up a national programme for rainwater harvesting. Techniques will be piloted in Irbid and Mafraq, while a possible incentive mechanism will be developed under output 4.4.

In the context of the reuse of treated wastewater in Lebanon, based on consultations implemented during the assessment phase of the project, an amendment of the treated wastewater conveying system is proposed whereby the earlier planned 3 km canal which involved a complicated permitting process and was able to irrigate an area of 150 ha only is suggested to be replaced by: 1- a storage reservoir in close proximity to the Zahle wastewater treatment plant and capable of accommodating a storage of half a day of treated wastewater (10.000 m^3) thus increasing water availability during the dry period when river flow and groundwater table are low, 2- a 3.8 km pumping line conveying the treated wastewater to a planted zone of 300 hectares (Zone A), and 3- a 5.5 km pumping line conveying the treated wastewater to a planted zone of 500 hectares (Zone B) (map included in Annex 2). The reservoir will be installed on a plot of and owned by the Municipality of Zahle. The pumping lines will also be installed in public domains.

Besides that, grey water treatment and reuse systems will be established in schools and mosques in Jordan, also targeting religious leaders and children for awareness raising purposes (under linked component 2).

In both Jordan and Lebanon, the quality of wastewater will be improved and water storage capacity increased to safely and efficiently irrigate agricultural land. In the target areas, release of untreated waste water and non-efficient use of treated waste water (due to lack of storage capacity and non-efficient irrigation techniques) has been identified as a major problem and priority (see section II.I). Besides that, permaculture demonstration sites will be established at a Local University / Research Centre in Jordan and at the Lebanese Agricultural Research Institute (LARI) in Lebanon, targeting students and surrounding farmers to replicate the techniques.

Component 4: Improving knowledge and policies and regulations to increase urban resilience in the region: Project KM and replication, incl. development of regional urban risks and vulnerabilities management model in the context of climate change and urban (population) growth (incl. from DPs migration) (in line with AF outcome 7).

This component will focus on Strengthened (inter)National institutional capacity sharing and cross-fertilization to manage climate change and DP crisis related urban water scarcity challenges, including 1) lessons learned and good practices collected from the implementation of the project activities at the national and local levels and shared regionally; and 2) establishing a permanent regional knowledge management (community of practice) platform as part of the ACCCP and RICCAR knowledge hub to discuss, operationalize and scale-up the regional urban risks and vulnerabilities management model and sustain experience sharing and dissemination among the concerned countries and other 3RP countries within the region beyond the project; and 3) organizing regional workshops for experience sharing among the participating countries but also the 3RP countries in addition to participating in relevant global events to advocate for the developed model beyond the region. Lessons learned, especially what worked and what did not, will be captured through monitoring of all project sub-interventions, also to identify what worked and what not. This would then feed into replication / upscaling guidelines, which will be developed for all sub-interventions (under component 2). All info will feed into output 4.3. the development of a Regional' urban risks and vulnerabilities assessment, planning and management approach model for type 2 cities. Field visits will also show what worked and what will not. As mentioned above, all collected information will be shared at the municipality, national level and international level, through workshops and conferences, but also by using a knowledge sharing platform.

Why is this needed: as mentioned above, there is a need for more effective, inclusive and sustainable programming focused on addressing water challenges, especially in 'host' (type 2) cities, exacerbated by both the influx of DPs and climate change impacts. There is an opportunity to share lessons between Lebanon and Jordan, but also in the region through the UN-ESCWA established Arab Centre for Climate Change Policies (ACCCP) and KM platform and to have the project outcomes and outputs feed into 3RP (i.e. Regional, Refugee and Resilience Plan) programming under the WASH sector (see annex 1) and replicated in cities facing similar challenges which sustains the knowledge generated by the project.

Overview proposed project activities

Table 6: Jordan and Lebanon proposed project activities details and feasibility assessment outcomes.
For detailed maps of target areas and conceptual drawings of concrete interventions, see annex 2.

Problem description and climate change adaptation needs statement	Adaptation measure outcome (to address the problem and needs)	Detailed outputs / activities	Target areas	Suitability	Beneficiaries (Total, Women, Youth, Syrians – T, W, Y and S used below		Budget (USD)	Executing entity	Effectiveness in terms of adaptation / water saving and or collection
					Direct	Indirect			
Component 1: Increasing the resilience of municipal governments: Manage urban risks and vulnerabilities in the context of climate change, esp. water scarcity challenges, and urban (population) growth, incl. from DPs migration									
Lack of municipal institutional and technical capacity to manage urban risks and vulnerabilities in the context of climate change, esp. water scarcity challenges, and urban (population) growth, including from DPs migration Lack of forward-looking planning, incl. capacity and tools at municipal level	Strengthen municipal institutional capacity to manage climate change and DP crisis related urban water scarcity challenges by mainstreaming these aspects into spatial strategies + developing action / investment plans and guidelines (with identified solutions) to use water most efficiently within municipal boundaries	1.1 Territorial planning and development strategy / guidelines at district level with climate change and gender mainstreamed in Lebanon. Outputs: project target areas climate change vulnerability map / profile, considering specifically drought / water scarcity challenges and floods. Development scenarios.	Zahle District	Target municipalities experience water challenges and have largest numbers of DPs in the country Proposed activities are aligned with national and municipal priorities, incl. municipal development plans Spatial strategies and urban master plans and action / investment plans / feasibility studies are suitable tools to plan water within municipal boundaries	Direct involvement T: 480 W: 40 % Y: 15 %	District: T: 429,824 W: 217,475 Y: 23,733 S: 243,465	249,000	Consultancy firm RTO	By planning and managing water in a forward-looking and holistically way, water will be managed much more efficiently and overall demand reduced
		1.2 Spatial / urban master plans at municipal level with climate change risks and vulnerabilities and gender mainstreamed in project target areas in Lebanon. Outputs: climate change risks / vulnerability maps / profile, considering specifically drought / water scarcity challenges and floods; urban observatory	Hazerta Bar Elias El Marj Saadnayel Taanayel Taalabaya Terbol Ferzol		Direct involvement T: 240 W: 40 % Y: 15 %	Municipalities: T: 167,631 W: 84,815 Y: 9,256 S: 94,951	530,000	Consultancy firm RTO	
		1.3 Spatial / urban master plans at municipal level with climate change risks and vulnerabilities and gender mainstreamed in project target areas in Jordan. Outputs: climate change risks / vulnerability maps / profile, considering specifically drought / water scarcity challenges and floods; urban observatory	Mafraq Irbid		Direct involvement T: 450 W: 45% Y: 10 %	Municipalities: T: 863,691 W: 415,440 Y: 259,107 S: 205,202	562,000	Consultancy firm + Municipalities	
Total					1,170		1,341,000		

Component 2: Increasing the resilience of citizens (DPs and host communities): Improve awareness, ownership and capacities to respond to climate change, incl. to operate, maintain and replicate resilient water harvesting, supply and irrigation systems									
Lack of citizen awareness of climate change, esp. water scarcity challenges and capacities to respond to these challenges locally	Strengthened DPs and host communities awareness and ownership of climate change adaptation measures + capacities strengthened to operate, maintain and replicate proposed adaptation measures, including skills building	2.1. Community organization, awareness and capacity building + operation, maintenance and replication / upscaling plans for concrete adaptation output 3.1: **Rooftop Rainwater Harvesting in Lebanon**	Zahle Ablah Hazerta, ~~Saadnayel~~ Bar Elias El-Marj	Citizens have limited awareness of water scarcity challenges, especially climate change-related Capacities to operate, manage and replicate relevant techniques are limited, esp. related to water harvesting, efficient irrigation and permaculture Large numbers of citizens can be reached through curricula, imams, demonstration sites, also in municipal government buildings	Direct involvement T: ~~55,000~~58,912 W:~~27,689~~29,658 Y: ~~2,950~~3,160 S: ~~29,300~~31,384	Municipalities: T: 300,877 W: 154,582 Y: 16,548 S: 170,296	195,400	UNICEF /Private Sector RTO (in line with output 3.1.and in coordination with LARI)	Increased acceptance efficient water use, supply and irrigation techniques Increased capacity to operate, maintain and replicate techniques, including monitoring
		2.2. Community organization, awareness and capacity building + operation, maintenance and replication / upscaling plans for concrete adaptation output 3.2: **Rooftop Rainwater Harvesting in Jordan**	Mafraq: Qasabit Mafraq Irbid: Qasabit Irbid Bani Obeid Ramtha		Direct involvement T: ~~52,855~~42,284 W: 21,136~~26,420~~ Y: 15,508~~19,385~~ S: 6,982~~8,728~~	Municipalities: T: 690,953~~863,691~~ W: 332,352~~415,440~~ Y: 207,285~~259,107~~ S: 164,162~~205,202~~	139,200	JOHUD (in line with output 3.2.)	
		2..3. Community organization, awareness and capacity building + operation, maintenance and replication / upscaling plans for concrete adaptation output 3.3: **Grey Water Treatment and Reuse in Jordan**	Mafraq: Qasabit Mafraq Irbid: Qasabit Irbid Bani Obeid Ramtha		Direct involvement T: 39,582 W:21,940 Y: 15,646 S: 6,827	Municipalities: T: 863,691 W: 415,440 Y: 259,107 S: 205,202	234,000	UNICEF (in line with output 3.3.)	
		2.4. Community organisation, awareness and capacity building + operation, maintenance and replication and upscaling plans for concrete adaptation output 3.4: **Efficient treatment and reuse of wastewater from Zahle WWTP, in Lebanon**	Zahle		Direct involvement T: 816 W: 416 Y: 85 S: 766	Municipalities: T: 184,332 W: 94,705 Y: 10,140 S: 104,332	~~163,200~~173,200	RTO UNICEF (in line with output 3.4)	
		2.5.Community organisation, awareness and capacity building + operation, maintenance and replication and upscaling plans for concrete adaptation 3.5: **Efficient treatment and**	Jerash(Kettelh) Mafraq (Al-Ghadeer Al-Abyad and Al-Akaider)		Direct involvement T: 35 W:5 Y: 2 S: 0	Municipalities: T: 11,229 W: 5,342 Y: 2,972 S: 727	16,000	MoWI / YARMOUK WATER COMPANY (in line with output 3.5.)	

Commented [LAE2]: Despite the decrease in number of rainwater harvesting buildings, the beneficiaries increased because a lot of Lebanese students who used to attend private schools are now attending public schools as a result of the financial crisis

		reuse of wastewater in Jordan							
		2.6. Community organization, awareness and capacity building + operation, maintenance and replication and upscaling plans for concrete adaptation output 3.6: **Water-use-efficient irrigation of treated wastewater for fruit trees and vineyards and potato plantation in Lebanon**	Zahle~~, Bar Elias~~		Direct involvement T: 4,495 W:2,293 Y: 540 S: 2,525	Municipalities: T: 184,332 W: 94,705 Y: 10,140 S: 104,332	~~142~~127,100	RTO/Company UNICEF/Private Sector (in line with output 3.6and in coordination with LARI)	
		2.7.1Community organization, awareness and capacity building + operation, maintenance and replication and upscaling plans for concrete adaptation output 3.7: **Water-use Efficient irrigation of treated wastewater from Maerad and Al Akaider WWTPs in Jordan**	Jerash (Ketteh) Mafraq (Al-Akaider)		Direct involvement T: 450 W:200 Y: 150 S: 150	Municipalities: T: 9,568 W: 4,528 Y: 2,474 S: 561	144,800	JOHUD (in line with output 3.7.1)	
		2.7.2.Community organization, awareness and capacity building + operation, maintenance and replication and upscaling plans for concrete adaptation output 3.7: **Water-use Efficient irrigation of treated wastewater from Mafraq WWTP in Jordan**	Mafraq (Al-Ghadeer Al-Abyad)		Direct involvement T: ~~300~~290 W:~~80~~120 Y: 135~~180~~ S: 75~~100~~	Municipalities: T: 1,740~~661~~ W: 480~~814~~ Y:810~~498~~ S: 450~~166~~	114,200	BADIA (in line with output 3.7.2)	
		2.8.Community organization, awareness and capacity building + operation, maintenance and replication and upscaling plans for concrete adaptation output 3.8; **permaculture demonstration in Jordan**	Irbid (Ramtha)		Direct involvement / targeted T: 300 W:150 Y: 45 S: 30	Municipalities: Students: 23,000 W: 11,500 Farmer family: 400 W: 200 Y: 60 S: 40	~~351,716.363~~ 14,600	PRI (in line with output 3.8	

Commented [JD3]: Those are the new estimated numbers that were provided by BADIA

		2.9.Community organization, awareness and capacity building + operation, maintenance and replication and upscaling plans for concrete adaptation output 3.9; **permaculture demonstration in Lebanon**	LARI Premises (located in Tal Amara) and Zahle Municipality; All Municipalities /communities that fall within the Zahle District.		T (Students) 270 (in 3 years) W: 135 T (Farmers) 340 W: 70 Y: 90 Syr: 70	T (Farmers families): 3,400 T (Surrounding municipalities / community): 8 municipalities W: 700 Y: 500 Syr: 480	418,171	UNICEF RTO (in line with output 3.9) and in coordination with LARI, Ministry of Education + Lebanese University)	
Total					T: 147,774~~101,588~~ W:>40 % Y:>15 %		1,~~918,787.36~~ 876,671		
Component 3: Increasing the adaptive capacity of the water sector: Expand unconventional water harvesting, supply and irrigation options, using innovative and replicable techniques suitable for the context									
Lack of water availability in target areas, which will worsen with climate change: Lack of using rainwater efficiently and lack of showcases to build on to set-up a municipal or national rainwater harvesting programme	Increased adaptive capacity within the water sector through resilient water harvesting options Water to be used for toilets, gardening, etc., not drinking Showcasing water harvesting options in different buildings	**3.1. Rooftop rainwater harvesting**in Lebanon ~~20~~ 10 systems at educational facilities (large) ~~11 Educational facilities~~ ~~7 Religious buildings~~ ~~1 Health facility~~ 1 Municipal building (show room in building with RWH system, ~~GWTR system~~ and WSDs	Zahle Ablah Hazerta ~~Saadnayel~~ Bar Elias El-Marj	Target municipalities experience water challenges and have largest numbers of DPs in the country Aligned with national and municipal priorities, incl. municipal development plans Municipalities are mandated to manage water within municipal boundaries, which includes rainwater harvesting options Schools and mosques are targeted because of large water harvesting	Direct involvement T: ~~55,000~~58,912 W:~~27,689~~29,658 Y: ~~2,950~~3,160 S: ~~29,300~~31,384	Municipalities: T: 300,877 W:154,582 Y: 16,548 S: 170,296	~~867,262~~460,776	UNICEF	~~1,410~~245 m3
		3.2. Rooftop rainwater harvesting in Jordan ~~86~~ 64 systems: 4~~0~~9 schools ~~(of which 18 rehabilitation)~~ 10~~15~~ mosques 14~~20~~ residential buildings ~~2 municipal buildings with RWH system~~	Irbid (Qasabit Irbid, Bani Obeid, Ramtha) Mafraq (Qasabit Mafraq)		Direct involvement T: 42,284~~52,855~~ W: 21,136~~26,420~~ Y: 15,508~~19,385~~ S: 6,982~~8,728~~	Municipalities: T: 690,953~~863,691~~ W: 332,352~~415,440~~ Y: 207,285~~259,107~~ S: 164,162~~205,202~~	836,820	JOHUD	Av school saving (Irbid):528m3 Av saving for 40 schools (Irbid): 21,120m3 Av school saving (Mafraq):101m3 Av saving 9 schools (Mafr): 909m3 Total: 22,029m3
Lack of water availability in target areas, which will worsen with climate change:	Increased adaptive capacity within the water sector through resilient water treatment and reuse options in buildings	**3.3.Greywater treatment and reuse** in Jordan 40 systems: 35 schools 5 mosques	Irbid (Qasabit Irbid, Bani Obeid, Ramtha) Mafraq (Qasabit Mafraq)		Direct involvement Schools: T: 39,582 W:21,940 S: 6827	Municipalities: T: 863,691 W: 415,440 Y: 259,107 S: 205,202	843,112	UNICEF	Potential Monthly Water Quantity Treated and Reused (m3): 4,369 m3

Commented [JD4]: Please note that the number of beneficiaries has decreased by 20% based on JOHUD's new calculations

Lack of using grey water efficiently	Water to be used for toilets, gardening, etc., not drinking			potential + awareness raising potential (see comp)					
Lack of water availability in target areas, which will worsen with climate change: Lack of re-using treated wastewater efficiently due to: Lack of quality Lack of storage capacity	Increased adaptive capacity within the water sector through resilient water treatment and reuse options - efficient use of treated wastewater systems through improved quality of treated wastewater + storage capacity for efficient irrigation purposes	**3.4. Efficient treatment and reuse of wastewater from Zahle WWTP, in Lebanon** Diverting the plant's treated effluent for irrigation purposes.	Zahle (Cadastres: Zahle Aradi, Zahle Haouch El-Oumara Aradi, Zahle Haouch EL-Oumara, Zahle Maallaqa Aradi)	Target municipalities experience water challenges and have largest numbers of DPs in the country Aligned with national and municipal priorities, incl. municipal development plans Farmers are facing water scarcity challenges because the WWTPs do not produce and store enough clean water; waiting list for farmers exist to get access to WWTP water (through contract) Zahle WWTP releases treated water into Litani River which does not directly benefit the area's farmers. Farmers use polluted water from rivers for crop irrigation.	From WWTP T: 3,~~017~~16,360 Women 2013~~8~~,407 Youth ~~216~~902 Syrians ~~2217~~9,260	Municipalities: T: 184,332 W: 94,705 Y: 10,140 S: 104,332	~~846,120~~2,241,556	UNICEF/RTO/Private Sector	~~18~~20,000 m3 treated daily for ~~110~~800 Hectares of agricultural lands
		3.5.1 Efficient treatment and reuse of wastewater in Jordan: Improving water quality and storage capacity for irrigation use from Maerad WWTP	Jerash (Ketteh)		T: 77 W:31 Y: 20 S: 15 Farms: 25	Municipalities: T: 7,919 W: 3,789 Y: 1,980 S: 396	1,053,332	MoWI / YARMOUK WATER COMPANY	Water Storage: 2~~3~~,000m3
		3.5.2 Efficient treatment and reuse of wastewater in Jordan: Improving water quality and storage capacity for irrigation use from Al Akaider WWTP	Mafraq (Al-Akaider)		T: 78 W:31 Y: 20 S: 15 Farms: 32	Municipalities: T: 1,649 W: 739 Y: 494 S: 165		MoWI / YARMOUK WATER COMPANY	Water Storage: 500 ~~2,000~~m3
		3.5.3 Efficient treatment and reuse of wastewater in Jordan: Improving water quality for irrigation use from Mafraq WWTP	Mafraq (Al-Ghadeer AL-Abyad)		T: 120 W:35 Y: 20 S: 25 Farms: 40	T: 1,661 W: 814 Y: 498 S: 166		MoWI / YARMOUK WATER COMPANY	Irrigated dunums: 100

Commented [LAE5]: The beneficiaries increased due to the increase in the area of land irrigated with treated wastewater from 150 to 800 hectares

				Treated water from WWTP in Jordan is lost during the night because of lack storage capacity and water already used by farmers lacks quality					
Lack of water availability in target areas, which will worsen with climate change: Lack of using water efficiently in agriculture practices	Increased adaptive capacity within the water sector through water efficient irrigation options – Efficient irrigation of treated wastewater to farmland with accepted irrigation technology	~~**3.6 Water-use-efficient irrigation of treated wastewater for fruit trees and vineyards in Lebanon** from Zahle WWTP, Lebanon Replace surface irrigation for fruits trees, vineyards and potato plantation with drip systems (pumps, filters, sensors, automated tools)~~	~~Zahle, Bar Elias~~	Target municipalities experience water challenges and have largest numbers of DPs in the country Aligned with national and municipal priorities, incl. municipal development plans; in Jordan, sprinklers are forbidden by law but still often used. Farmers are facing water scarcity challenges but often don't use efficient water use irrigation systems	~~T: 4,495 W:2,293 Y: 540 S: 2,525 F: Leb: 394; Syr: 505~~	~~Municipalities: T: 253,456 W: 130,219 Y: 13,941 S: 143,456~~	~~988,950~~	~~UNICEF/RTO/Private Sector~~	~~150 Hectares~~
		3.7.1 Water-use Efficient irrigation of treated wastewater from Maerad and Al Akaider WWTPs in Jordan. Modern irrigation system	Jerash (Ketteh) Mafraq (Akaider)		T: 155 W:62 Y: 40 S: 30 Farms: 40	Municipalities: T: 9568 W: 4528 Y: 2474 S: 561	804,400	JOHUD	120 donums Increase the amount of reclaimed water allocated for irrigation to 15%
		3.7.2Water-use Efficient irrigation of treated wastewater from Mafraq WWTP, Jordan. Modern irrigation system	Mafraq		T: 85~~120~~ W:25~~35~~ Y: 15~~20~~ S: 20~~25~~ Farms: 25~~40~~	T: 435~~1,661~~ W: 150~~814~~ Y: 90~~498~~ S: 75~~166~~		BADIA	75~~100~~ donums Increase the amount of reclaimed water allocated for irrigation to 15%
Lack of water availability in target areas, which will worsen with climate change: Lack of using water and other resources Incl. waste) efficiently in agriculture production systems	Permaculture demonstration site showing efficient water use system for student and farmers; This includes organic production examples that increase the quality and the quantity of soil (creating a bio-sponge) while producing nutrition-	**3.8 permaculture demonstration – efficient water use system** Bio-Fertilizer production; Crop Garden and Compost Egg laying Chickens; ~~Bees / apiculture;~~ Compost worms; Olive Orchard Monoculture Conversion to Food Forest	Jordan University of Science and Technology campus Irbid (Ramtha)	Target areas experience water challenges and have the largest numbers of DPs in the country; Farmers are facing water scarcity challenges but often don't use water efficiently;	T: 300 W:150 Y: 45 S: 30 Students: 200	Students: 23,000 W: 11,500 Farmer family: 400 W: 200 Y: 60 S: 40 Community: 2,000 W: 1,000 Y: 300	~~346,929.643~~ 84,046	Permaculture Research Institute in cooperation with ~~Jordan University of Science and Technology (JUST)~~Local University	Water is saved by increasing the quality and the quantity of soil, creating a bio-sponge.

Commented [JD6]: Please note that these changes were made after BADIA's new estimations

	dense food. This system reduces water needs			The area experiences unsustainable land use / agriculture practices that resulted in degradation of ecosystems leading to reduced services and food security issues		S: 200		/ Research Centre	
		3.9. permaculture demonstration – efficient water use system Agricultural Waste Management for Sustainable Crop Production Urban, Peri-Urban and Rural Agriculture and Water Harvesting as Adaptation Measures Apiculture and the reduction of chemical substance use at farm level Introducing adapted crop varieties and diversifying farm production	LARI Premises (located in Tal Amara) and Zahle Municipality; All Municipalities /communities that fall within the Zahle District.		T (Students) 270 (in 3 years) W: 135 T (Farmers): 340 W: 70 Y: 90	T (Farmers families): 3,400 T (Surrounding municipalities / community): 8 municipalities W: 700 Y: 500 S: 480	885,725	UNICEF, RTO and involved Municipalities (in coordination with LARI)	
Total					T: ~~157,309~~158,563 (much overlap with comp 2) W:>40 % Y:>15 %		7,~~472,650.64~~ 514,767		
Component 4: Improving knowledge and policies and regulations to increase urban resilience in the region: Project KM and replication, incl. development of regional urban risks and vulnerabilities management model in the context of climate change and urban (population) growth (incl. from DPs migration)									
Lack of (inter)national institutional and technical capacity to manage urban risks and vulnerabilities in the context of climate change, esp. water scarcity challenges, and urban (population) growth, including from DPs migration	Strengthened (inter)National institutional capacity to manage urban climate change and DP crisis related water scarcity challenges, including lessons learned collected and shared regionally; Through these activities knowledge between Jordan and Lebanon and the larger MENA / Arab region will be shared + some global exposure	4.1 Regional / international KM with focus on sharing project lessons and replication	MENA + Arab region and global	The MENA region is the most water scarce region in the world combined with the highest share of DP urban population Climate change action considering DPs crisis impacts, esp. in urban areas, is very limited	T: 200 W:>40 % Y: >15 %	Total MENA region	280,000	UN ESCWA	By planning and managing water in a forward-looking and holistically way, water will be managed much more efficiently and overall demand reduced
		4.2 Jordan and Lebanon KM with focus on project progress, best practices and lessons learned	Jordan & Lebanon		T: 200 W:>40 % Y: >15 %	All target ministerial and municipal staff	437,800		
		4.3 Sub-national KM and Regional' urban risks and vulnerabilities assessment, planning and management approach model for type 2 cities	Target municipalities		T: 200 W:>40 % Y: >15 %	All target municipal staff	165,000	Consultancy firm RTO	
		4.4 Incentive mechanism (financial) and regulatory framework to replicate and upscale rainwater harvesting activities	Jordan and possibly Lebanon		T: 200 W:>40 % Y: >15 %	All target municipal staff	40,362	Consultancy firm RTO	
Total					T: 800 W:>40 % Y:>15 %		923,162		

Grand total	T: 120,951135,000 W:>40 % Y:>15 %	11,655,600

B. Promotion of innovative solutions

Component 1: The proposed Territorial planning and development strategy (district-level) and urban master plans at municipal level and urban observatories aim to enable district and municipal governments to manage climate change and DP crisis related urban water scarcity challenges and flood risks, within their borders through a participatory approach. This approach will allow for more coordinated and forward-looking investment in infrastructure and services, which is currently lacking in the target areas and at the municipal level. The approach is not only unique for the target countries and target municipalities, but also for the region, as the assessment and planning approach responds to both climate change and DP crisis issues and aim to reduce tension over scarce resources. Therefore, the replication of this model will be promoted (through outputs 4.1, 4.2 and 4.3).

Component 2: The proposed measures aim to ensure sustainability (maintenance and replication) of the proposed concrete adaptation measures under component 3. Although this is not innovative, using community-level adaptation related planning and decision-making (also under component 1) as a tool to enhance social cohesion (i.e. avoid tension over scarce resources) is unique and very relevant and timely in the case of Lebanon and Jordan, where increased tension between DPs and host communities has been reported. Especially women and youth groups will be encouraged to participate in the exchange and planning process.

Component 3: The project proposes to use innovative internationally proven technologies to increase water availability from non-conventional sources and using it efficiently, while in that way reducing water demand from conventional sources such as (often polluted) groundwater. The purpose is the showcase intervention / techniques that are suitable for urban areas, considering urban-rural linkages, and that can also be used elsewhere in Jordan, Lebanon and in the region. Although some rainwater harvesting initiatives exist in Jordan and Lebanon, showcasing these in various types of buildings, including costs and benefits and replication options, will be a step to upscale such 'lose' initiatives towards municipal and even national rainwater harvesting programmes (see output 4.4), which has been pointed out as a priority in Jordan. Wastewater treatment and its use in agriculture is practiced in Jordan, but the water quality of often not good enough and storage capacity is lacking. In Lebanon, treating wastewater to a quality that it can be used in agriculture is not common practice and to showcase best practices, including standards, in both Jordan and Lebanon can be examples for both countries (which exchange to learn from both approaches (under output 4.2) and the larger region (under output 4.1.).. While drip-irrigation exists in both Jordan and Lebanon, sprinklers are still often used. Therefore, a transfer to more water-use efficient irrigation technology is needed. The innovative permaculture concept has shown to be promising in Jordan through the national AF project and will be promoted through students (to be involved with surrounding farmers and communities) and in the region (output 4.1) and in Lebanon (through output 4.2).

Component 4, The assessment and planning approach under component 1 is not only unique for the target countries and target municipalities, but also for the region, as it responds to both climate change and DP crisis issues and aim to reduce tension over scarce resources. Therefore, the model will be further developed under output 4.3, including best practices (and standards) of proposed concrete adaptation measures and replication of this model will be promoted through outputs 4.1, 4.2 and 4.3. Under output 4.4. mechanisms to upscale rainwater harvesting initiatives towards municipal and even national rainwater harvesting programmes will be identified, which would be a great step towards a national water saving impact.

C. Economic, social and environmental benefits

The proposed project aims to maximize benefits to the most vulnerable groups, including DPs, poor Lebanese and Jordanians, women and youth, and to avoid any negative environmental and social impacts.

Table 7: Project Economic, Social and Environmental benefits

Type of benefit	Baseline	With/after project
Economic	Climate change is already leading to economic and livelihood losses, especially caused	The governments, at different levels, but especially at the municipal level, will be able to better assess, plan and manage scarce water resources also considering climate change impacts and vulnerabilities, which are also of economic importance Through rainwater harvesting and grey water treatment and reuse interventions, water losses will be reduced / water saved, which will also save costs.

	by less rain, droughts and water evaporation. Water dependent livelihoods, especially in the agriculture sector, are especially threatened; A large share of DPs, poor Lebanese and women are dependent on the agriculture sector for their income	Through the treatment and reuse of wastewater interventions, water losses will be reduced / water saved, which will also save costs, both for the Water Authorities of Jordan (esp Yarmouk, which has very limited resources), but also for the farmers, as water will be provided against reasonable costs. Without this intervention, farmland may be lost, which is also a treat to food security. The agriculture sector in target areas will be more climate change / drought resilient, leading to improved livelihood security, benefitting especially DPs, poor Lebanese and Jordanians, women and youth, with more secure / higher income. The permaculture intervention is to show student and farmers that through this approach water and resources can be used efficiently, making it a replicable business case. It will also increase crop diversity and productivity;
Social	Climate change is already leading to negative social impacts, especially caused by less rain, droughts and water evaporation, leading to rural –urban migration, and social tension and incoherent development.	The governments, at different levels, but especially at the municipal level will be able to better assess, plan and manage scarce water resources also considering climate change impacts and vulnerabilities, also with the purpose to enhance social cohesion (i.e. avoid / reduce tension) over scarce water resources. Inclusive assessment, planning and decision-making processes over scare water resources, also involving DPs, poor Lebanese and Jordanians, women and youth, will enhance social cohesion (i.e. avoid / reduce tension) over scare water resources. Climate change resilient techniques skills building activities, including to operate, sustain and replicate these (especially targeting women and youth) + resilient water supply and irrigation systems, will benefit the most vulnerable, including DPs, poor Lebanese and Jordanians, women and youth. Water resources and water dependent livelihoods (i.e. agriculture) will be protected from pollution and through waste water treatment. This will reduce health issues, of whom the most vulnerable / poor groups suffer the most. Currently, water-related health issues are very high in the Bekaa area compared to other areas. Harvesting systems and grey water reuse in public buildings, especially schools, will raise awareness for sustainable water use and climate change for students and through religious leaders 'Peacebuilding' through involving youth and thus reducing possible tension between host and DP communities that is most likely to occur among youth.
Environmental	Climate change is already leading to negative environmental impacts, especially land / soil degradation and desertification and overexploitation of resources. Moreover, due to the crisis, untreated wastewater is increasingly polluting water resources	The government, at different levels, will be able to better assess, plan and manage scarce water resources, also considering climate change impacts and vulnerabilities. Water resources and water dependent livelihoods (i.e. agriculture) will be protected from pollution and through waste water treatment. This will reduce health issues, of whom the most vulnerable / poor groups suffer the most. Currently, water-related health issues are very high in the Bekaa area compared to other areas; Waste water treatment and reuse facilities to irrigate agriculture land and efficient water use options and permaculture will reduce groundwater and agriculture pollution while enhancing sustainable access to water, thus also securing agriculture livelihoods. Rooftop rainwater harvesting increases water availability at building and residential household level, and reduces urban flash flooding probabilities and reduces illegal connection to wastewater network thus reducing manhole flooding in the streets in winter season. Introduction of unconventional water sources will help decrease pressure on the already depleting groundwater resources in some areas. Permaculture: water needs reduced; pesticides and related soil/water pollution reduced; overall land / soil degradation reduced.

The number of direct beneficiaries is estimated at 930 for component 1, ~~101,588~~158,345 for component 2, ~~157,309~~158,562 for component 3 and 600 for component 4 (see table 6). Approximately one fourth of the target population is Syrian. Targets for women and youth are set at 40 percent for women and 15 percent for youth. Because there is some overlap with beneficiaries between component 2 and 3, the total number of project direct beneficiaries is estimated at around ~~120,000~~135,000. However, with a large share of the project activities focus on replication and knowledge sharing, the number of indirect beneficiaries is expected to be very large. Moreover, indirect positive impacts of increased water availability and quality and livelihood sustainability is expected to have benefits for whole communities.

Commented [LAE7]: Adding the additional beneficiaries from the rainwater harvesting systems and the increase in area irrigated with wastewater

D. Cost-effectiveness

Table 8: Proposed adaptation actions' cost-effectiveness rationale

Proposed adaptation actions / outputs	Rationale why priority actions have been selected from a cost-effectiveness perspective and alternative actions considered
1.1. Territorial planning and development strategy / guidelines with CC and gender mainstreamed in Lebanon 1.2. Urban master plans at municipal level with CC and gender mainstreamed in Lebanon 1.3. Urban master plans at municipal level with CC and gender mainstreamed in Jordan	A total of over 1 million people in the project target areas (inhabitants of the target municipalities) will benefit from municipal level master plans. This is little over USD 1 per inhabitant. Municipal master plans with climate change mainstreamed into it are a cost-effective ways to assess, plan and manage municipal assets and infrastructure, including water resources (esp non-conventional sources such as rain/stormwater), also looking at future needs. Alternatively, in a no action scenario, municipalities will continue prioritizing actions that are not climate change resilient and sustainable or don't address the source issues. Moreover, without the municipal plans, water is only managed conventionally at the governorate / national level, mostly looking at current need and supply from groundwater, which is not sustainable and doesn't allow for using non-conventional water sources such as rain/stormwater efficiently within municipal boundaries. Thus, the municipal plans will complement the national water master plans. Through the National Urban Policy and climate change data coordination mechanism between the national and municipal level (i.e. observatories) the plans will effectively complement and guide national plans. Integrated Water Resource Management is an alternative approach to comprehensively plan and manage water within a system, but this is not a ministry priority. For an overview of possible concrete measures that could be prioritized as a result of municipal planning and an indication of the contribution to adaptation, see the tables below.
2.1. Community organisation, awareness and capacity / skill building + operation, maintenance and replication and upscaling plans for concrete adaptation output 3.1 2.2. See above for output 3.2. 2.3. See above for output 3.3. 2.4. See above for output 3.4. 2.5. See above for output 3.5. 2.6. See above for output 3.6. 2.7. See above for output 3.7. 2.8. See above for output 3.8 2.9. See above for output 3.9	Participatory planning processes are required to ensure ownership over to be implemented concrete adaptation measures. Participatory processes to operate, maintain and replicate interventions is required to sustain them. Moreover, some monitoring activities are needed to measures to effectiveness and sustainability of proposed concrete measures Alternatively, interventions are planned and executed top-down, but this may lead to lack of ownership and capacity to operate, maintain and replicate proposed concrete measures, which would result in a loss of investment
See outputs for concrete adaptation interventions below.	See details in tables 8a and 8b below
4.1. Regional / international KM with focus on sharing project lessons and replication 4.2. Jordan and Lebanon KM with focus on project progress, best practices and lessons learned 4.3. Sub-national KM and Regional' urban risks and vulnerabilities assessment, planning and management approach model for type 2 cities 4.4. Incentive mechanism (financial) and regulatory framework to replicate and upscale rainwater harvesting activities	Regional project steering committee meetings (output 4.2) are organised, where possible, in conjunction with relevant regional events (output 4.1), thus avoiding double costs for travel and allowances. Relevant project lessons will be shared regionally and even globally through an existing relevant KM platform (output 4.1),and outreach mechanism, thus avoiding cost for this. Replicating the model developed under output 4.3. (through outputs 4.1 and 4.2) may result in adoption of the model elsewhere and in that way increase efficient use of water, also looking at the future, and in that way, avoiding related cost of non-adoption. Alternatively, best practices and approaches are not shared regionally, which may lead to loss of investments is countries and urban areas, which need to deal with similar situations.

Possible concrete measures as a result of municipal planning include

Measures	Contribution to adaptation (efficiency)[87]

[87] Estimation based on: https://academicjournals.org/journal/IJWREE/article-full-text-pdf/321328465147
https://jordantimes.com/news/local/public-urged-harvest-rainwater

Regulations / by-laws to e.g. harvest water and / or reduce water consumption (e.g. through building codes and zoning conditions / permits or restrictions on development in risk areas (esp. for floods) Financial incentives to e.g. harvest water or reduce consumption (through reduced municipal taxation for building permits that abide by the municipal climate planning) or to use water saving devices	Water consumption reduction: up to 30 percent Avoidance of flood-related costs to new development and reduction of human and economic losses.
(Green) infrastructure spatial planning to plan and design water harvesting locations, improve the efficiency of the irrigation network and reduce flood risks	Water consumption reduction: up to 45 percent Flood prevention and avoidance of flood-related costs to new development Water consumption reduction: up to 37,5 percent
Assets - (Upstream) storm/ rainwater harvesting or groundwater recharge instead of e.g. constructing downstream drainage channels to reduce flood risks. - Building-level rainwater harvesting (in other areas where concrete measures are taken under project component 3) - Agriculture: farmer-level water storage ponds (in other areas where concrete measures are taken under project component 3), change of crop varieties; change of sewing dates	Avoiding costs of: - Selection of non-appropriate / non effective measures). This could be millions (USD) for drainage channels in one neighbourhood alone - Crop failure

In Jordan, the rain/stormwater harvesting potential from roads is:

Municipality	Surface Zoned Area (km^2)	(20% of areas as roads) (km^2)	Annual Rainfall (mm)	Runoff Coefficient	Potential rainwater to be harvested yearly (m^3/y)
Irbid	190	38	500	0.8	15,200,000
Mafraq	120	24	200	0.8	3,840,000
Total					**19,040,000**

Rainwater harvesting potential through building rooftops- calculated based on building licenses issued by Municipalities of Irbid and Mafraq in (2019):

Municipality	Number of Building Licenses	Building Area (m^2) (Assumed average 150m^2)	Annual Rainfall (mm)	Runoff Coefficient	Potential rainwater to be harvested yearly (m^3/y)
Irbid	5,653	847,950	500	0.8	339,180
Mafraq	1,501	225,150	200	0.8	36,024
Total					**375,204**

In Lebanon, the rain/stormwater harvesting potential is:

District (covering all target municipalities)	Surface Area (km^2)	Annual Rainfall (mm)	Runoff Coefficient	Potential rainwater to be harvested (m^3)	(20% of areas as roads)
Zahleh	436	700[88]	0.8	244,160,000	48,832,000

Built-up areas (2019 – Geo spatial identification):

District (covering all target municipalities)	Surface Area (m^2)	Annual Rainfall (mm)	Runoff Coefficient	Potential rainwater to be harvested (m^3)
Zahleh	320,000	700	0.8	179,200

[88] 2019 Yearly average was 750 mm, 2020 is 650 according to the Lebanese Agriculture Research Institute (LARI)

Table 8a: Jordan proposed concrete adaptation actions' cost-effectiveness rationale under component 3

Adaptation measure	Total project cost	Beneficiries		Cost-effectiveness (Total Cost/ Beneficiaries)		Alternative Solutions	Justification
		Direct	Indirect	Direct (USD/ Beneficiary)	Indirect (USD/ Beneficiary)		
3.2. Install and connect 6486 Rooftop rainwater harvesting systems (of which 18 rehabilitation) ~~in 2 municipal~~in ~~buildings,~~ 1420 residential buildings, 4049 schools and 1015 mosques.	836,820	T: ~~52,855~~42,284	T: 690,953~~863,691~~	19.791~~5.5~~	1.21~~0.~~95	**Alternative 1**: Boreholes/Tubewells (groundwater abstraction). **Total cost:** 1,290,000USD[89] **Cost per beneficiary: Direct:** 32.6USD **Alternative 2**:Rainwater Collection from Ground Surface. **Total cost:** Approx. 924,000*****USD[90] **Cost per beneficiary: Direct:** 17.4 USD *** Excluding show room (2) with RWH system, GWTR system and Water Saving Devices (WSD), costed at (100,000USD).**	1. The over-abstraction from the aquifers deteriorates the groundwater quality, increasing its salinity and deepening the static and dynamic water levels. 2. It is assumed that the additional cost implication for over-pumping is equivalent to the cost of desalination, which is estimated at 2.12USD /m3 (this figure is used for both, camps and host communities). Therefore, the environmental cost is estimated at 99 USD/person. 3. Rainwater collection from ground surfaces requires constant surface rehabilitation. 4. Excavations and use of water cisterns will be limited to sites where the available space is limited and a mounting rectangular tank can't be used, to make sure the intervention is as cost effective as possible. 5. According to the Climate Change Policy for a Resilient Water Sector published by the MoWI. RWH is among the prioritized solutions, as it scores highly in regards to cost efficiency and synergy between adaptation and mitigation. 6. According to an article by former Minister of Water Eng. Hazem Naser[91], a 150-square-metre house in areas with average annual rainfall of 350 millimeters (mm) can collect at least 50 cubic meters of pure water annually by channeling rainwater to cisterns. And that installing a water harvesting system can reduce household water bills up to 40% annually. 7. A study by Assayad showed that, rainwater harvesting can save 70-340 USD annually due to alleviating the need for purchasing private water tanks.
3.3. Greywater treatment and reuse in 35 schools and 5 mosques	843,112	T: 39,582	T: 863,691	21.3	0.98	**Alternative 1**: Sand Filter System **Total cost**: 792,000USD **Cost per beneficiary: Direct:** 20USD **Alternative 2**: Constructed Wetlands: The wetland system composes of a rectangular basin that is constructed underground and filled with gravel or sand or a combination of both. **Total cost**: 1,352,000*USD **Cost per beneficiary: Direct:** 34USD ***Excluding potential cost of land acquisition**	1. Sand filters are among the most commonly used systems in the treatment of greywater, however are restricted by low efficiency of BOD, COD, and TOC removal and prone to frequent clogging problem, requiring more frequent maintenance, thus, more expensive O&M cost (approx.. 56,000/year), or else may result in effluent that is not in compliance with the Jordanian National Standards. 2. Constructed wetlands primary requirement is a continuous supply of water, which is not the case in schools since influent flow will be intermittent.

[89] https://backend.orbit.dtu.dk/ws/portalfiles/portal/7689720/TNA_Guidebook_AdaptationWater.pdf
[90] Intermittent water supplies: challenges and opportunities for residential water users in Jordan; David E. Rosenberg, Samer Talozi and Jay R. Lund
[91] https://jordantimes.com/news/local/public-urged-harvest-rainwater

3.5. Efficient treatment and reuse of wastewater in Jordan	Maerad Akaider Mafraq	1,053,332	T 275	T: 11,229	4,098.6	93.9	**Alternative 1:**Construction of new WWTP with a capacity of 100,000 m^3 per day, **Total cost:** Approx. 340,000,000*USD[92] **Cost per beneficiary: Direct:** 1,236,363.6USD **Alternative 2:** Expansion of existing WWTP (increase capacity by 100,000 m^3) **Total cost:**282,000,000USD[93] **Cost per beneficiary: Direct:** 1,025,454.6USD	1. According to the Climate Change Policy for a Resilient Water Sector published by the MoWI. Wastewater reuse is among the prioritized solutions, as it scores highly in regards to cost efficiency and synergy between adaptation and mitigation. 2. Wastewater reuse will help preserve the natural resource, and decrease illegal groundwater pumping which is decreasing the quality and quantity of water in Jordan.
3.7. Water-use Efficient irrigation of treated wastewater in Jordan	Maerad Akaider Mafraq	804,400	T~~275~~ 240	T: ~~11,229~~ 10,003	~~2,925.1~~ 3,351.7	~~71.6~~80.4	**Alternative 1:** Surface drip irrigation **Total cost**: 563,080USD **Cost per beneficiary: Direct:** 2,047.6USD **Alternative 2:** Flood irrigation **Total cost**: 171,020 **Cost per beneficiary: Direct:** 621.9USD	1. Subsurface irrigation pipes and fittings usually cost 4,231USD per dunum. However, a system with pipes and fittings costing 2,000USD per dunum was successfully tested locally, and will be used for this intervention. 2. Surface drip irrigation is initially cheaper to set up, however, very costly from an operational point of view, based on previous experiences at every harvest (8 times annually), pipes are damage and pulled out of place. The consulted farmers expressed that they do not prefer surface drip irrigation. 3. Flood irrigation requires an amount of water much higher than the current average amount of 1-3 m^3 per planted dunum, leaving some areas of land uncultivated besides the high evaporation rate. This goes against the objective of project, which is to decrease use of unsustainable water resources.
3.8. Permaculture demonstration - closed loop water system in Jordan		384,046	T: 300	25,400	1,280.2	16.7	**Alternative 1:** Monoculture system **Total cost**: 326,632USD **Cost per beneficiary: Direct:** 2,047.6USD	1. Monoculture systems decrease life in the soil and results in water loss and an increase in the need to use chemical fertilizers and pesticides. 2. Irrigation constituted about 53% of total water use in Jordan in 2014. (Figueroa, Mahmoud and Breisinger, 2018). In comparison with the average crop water use in Jordan, permaculture results in a 50% reduction by using compost which increases water retention in soil, 100% reduction in chemical use and up to 200% increase in yield.

Table 8b: Lebanon proposed concrete adaptation actions' cost-effectiveness rationale under component3

Adaptation measure	Total project cost	Beneficiaries		Cost-effectiveness (Total Cost/Beneficiaries)		Alternative Solutions	Justification
		Direct	Indirect	Direct (USD/Beneficiary)	Indirect (USD/ Beneficiary)		
3.1. Install and connect ~~20~~ 10 Rooftop rainwater harvesting systems in ~~11~~ educational facilities~~, 7 religious buildings, 1 health facility~~ and 1	~~867,262~~ 460,776	T: ~~55,000~~58,912	Municipalities: T: 300,877	~~15.77~~7.82	~~2.881~~.53	**Alternative 1**: Boreholes/wells (groundwater abstraction of at least 50 meters with energy, pumps and filtration units – not considering O&M costs)[94]. **Total cost:** 2,300,000USD[95] **Cost per beneficiary: Direct:** 41.8USD	1. Rainwater collection from ground surfaces requires constant surface rehabilitation and below ground tanks (i.e. cisterns) which require excavations. 2. The over-extraction from the aquifers deteriorates the groundwater quality, increasing its salinity and deepening the static and dynamic water levels.

[92] https://www.oecd.org/derec/adb/47174022.pdf
[93] https://www.miga.org/sites/default/files/archive/Documents/Samra-ESIA_Final_Report_May7.pdf
[94] According to The National Geothermal Resource Assessment of LEBANON (UNDP 2014), wells cost depend on many factors and vary with time, location and the specific: material (cement, drilling mud, etc.), energy supply, logging and testing, services, pumps, heat exchanger, pipes, slop systems, filters.
[95] According to CDR reports, drilling, equipping of three medium size water wells cost 350,000USD (around 115,000USD/ well).

showroom in a municipal building.						**Alternative 2**:Rainwater Collection from Ground Surface. For the same stored quantities. **Total cost:**1,417,500USD[96] **Cost per beneficiary:Direct:**25.77USD	
3.4. Efficient treatment and reuse of wastewater from Zahle WWTP in Lebanon. Initially, wetlands were also proposed but these were not feasible politically.	846,120 2,246,556	From WWTP T: 3,91716,360	Municipalities: T: 184,332	216137.014	4.6012.16	**Alternative 1:**Construction of new mobile WWTP with a capacity of 5,000 m^3 per day, **Total cost:** Approx. 1,200,000USD[97] **Cost per beneficiary: Direct:** 306.4USD *** Excluding costs of required full comprehensive ESIA studies, operation and maintenance costs, sludge disposal, energy requirements.** **Alternative 2:** Expansion of existing WWTP (increase capacity to maximum 35,000 m^3) This requires completion of the networks upstream in Zahle **Total cost:**10,000,000USD[98] **Cost per beneficiary: Direct:** 2,553USD	1. According to the National Water Sector Strategy (MoEW). Wastewater reuse is among the prioritized solutions, especially with the continuous depletion of underground water resources, and the 8% decreased in precipitation during the last 30 years compared with earlier periods of the previous century[99]. 2. Wastewater reuse will help preserve the natural resource and decrease illegal groundwater pumping which is decreasing the quality and quantity of water in Lebanon.
3.6.Water-use-efficient irrigation of treated wastewater for fruit trees, vineyards and potato plantation in Lebanon from Zahle WWTP, Lebanon	988,950	T: 4,495	Municipalities: T: 253,456	220	3.9	**Alternative 1:** Surface drip irrigation **Total cost**: 937,500USD **Cost per beneficiary: Direct:** 208.57USD **Alternative 2:** Flood irrigation **Total cost**: 210,415USD **Cost per beneficiary: Direct:** 46.8USD	1. Subsurface irrigation pipes and fittings usually cost4,250USD per hectares. However, a system with pipes and fittings costing 2,000USD per hectare. 2. Surface drip irrigation is initially cheaper to set up, however, very costly also due to the damage caused at every harvest (8 times annually), where pipes get pulled out of place. 3.1. Flood irrigation requires an amount of water much higher than the current average amount of 1-3 m^3 per planted hectare, leaving some areas of land uncultivated besides the high evaporation rate and dry seasons.
3.9 Permaculture demonstration - closed loop water system in Lebanon	885,725	T (Farmers) : 340	T (Farmers families): 3400	1,452	260.5	**Alternative 1:** Monoculture system **Total cost**: 753,168USD **Cost per beneficiary:Direct:**221.5USD	1. Monoculture systems decrease life in the soil and results in water loss and an increase in the need to use chemical fertilizers and pesticides. 2. Permaculture results in 50% reduction in water use by using compost which increases water retention in soil, 100% reduction in chemical use and up to 200% increase in yield.

[96] UN-Habitat Lebanon implemented an underground surface water catchment basin of 80 cu.m in 2018, with all needed drainages, pumps, piping, casing, insulation, connection to electricity, the final cost was 54,000USD.
[97] Cost estimated by World Vision International for a mobile WWTP in Qabb Elias.
[98] According to Zahle mayor.
[99] National Water Sector Strategy (NWSS), Ministry of Energy and Water (MEW), 2010.

Altogether, the project will be cost-effective by:

- ❑ Avoiding future costs associated with damage and loss due to climate change impacts (especially less rain and droughts) and to ensure the interventions are sustainable;
- ❑ Efficient project operations because of 'in-house' technical support options and capacity building expertise and because of direct partnering with communities (thereby building their capacity as well as reducing costs) and specialist agency such as UNICEF and UN-ESCWA
- ❑ Community involvement with development / construction of concrete interventions and because of community capacity building especially for youth who would ensure the sustainability of the project.
- ❑ Having selected technical options based on cost, feasibility and resilience/sustainability criteria.

E. Consistency with national or sub-national strategies

Both Jordan and Lebanon have advanced climate action agendas, since both countries ratified the UNFCCC in 1994. Both countries submitted the Third National Communications (TNC) and an INDC to the UNFCCC, while also having done Climate Change Technical Needs Assessments TNA). Jordan also has a national climate change policy (also for water). However, the institutional and individual capacities, especially at sub-national levels, for effective climate programming (e.g. through spatial strategies and planning) is still weak. A detailed overview of project consistency with all relevant national and sub-national priorities has been developed in table 9 below.

The project proposal especially aligns with the INDC, TNC and TNA and National Water (Sector) Strategies in both countries. In Jordan, the project proposal also aligns with the National climate change policy (for water). Relevant ministries have been consulted to fully align with their most recent priorities (see section II.I). During the full proposal development phase, the established national project steering committees re-prioritised some interventions, including the selected WWTP in Jordan. In both Jordan and Lebanon, municipalities are mandated to develop municipal master plans. Moreover, municipalities are required to manage water, especially non-conventional sources such as stormwater and rainwater, within their municipal boundaries. Although Irbid has a master plan, it is outdated and other municipalities don't have these plans, which can be used to manage water within their boundaries, including consideration of climate change, DPs migration trends and gender.

Table **9:** Jordan project alignment with National and sub-national priorities

Policy / Document	Year submitted / ratified	Relevant priorities
Jordan		
Climate Change strategies / plans		
Jordan's Climate Change Policy for a Resilient Water Sector (2016-2025)	2016	This document is an integral part of the National Water Strategy (2016 – 2025) and related policies and action plans published by Ministry of Water and Irrigation (MoWI). It lists a number of water-related solutions that the project aligns with. These include: Water storage e.g. dams & reservoirs and ponds New water, water harvesting (in combination with supplementary irrigation for drought and climate-proofing and increasing the water use efficiency of primarily rain fed agriculture, which is practiced on 60% of Jordan's cropland), water transfers, wastewater collection/treatment/reuse Water quality protection and improvement, to increase water availability for unrestricted use; Integrated water and land planning / management / zoning, water-smart land use, including urban planning Water (and energy) demand management: via technical measures, e.g. infrastructure rehabilitation and reduction of transmission losses (according to the 3rd National Communications the main threat to rainfed cultivation in Jordan is urban expansion). Better use of rainfall, more efficient irrigation Improvements in water use efficiency, e.g. driven by demand-management or water reallocations, these generally also translate into energy savings18; Training and capacity development: public awareness and behavioural change e.g. mainstreaming climate expertise into water management, facilitating the use of climate

		data for planning and early warning (climate services); and training of experts for writing successful proposals to international climate funds. The action plan for the Climate Change Policy can build on existing Integrated Water Resources Management (IWRM) activities. However, the implementation has been slow so far. In order to avoid such problems, the action plan needs to include incentives for effective implementation and enforcement of the Climate Change Policy.
Jordan's Third National Communication on Climate Change	2014	A document submitted to UNFCCC by the Ministry of Environment and United Nations Development Programme, it stated that the expected reduced precipitation, maximum temperature increase, drought/dry days and evaporation are the main determinants of climate change hazards. The impact of the increased evaporation and decreased rainfall will result in less recharge and therefore less replenishment of surface water and groundwater reserves. In the long term, this impact will extend to cause serious soil degradation that could lead to desertification, exacerbating future conditions and worsening the situation of the agricultural sector due to the lack of sufficient water that will affect the income of the agriculture sectors. The proposed project aligns with the document by; Enhancing climate vulnerability analysis at the local level. Implementing the adaptation strategies and measures suggested by the report specifically for the water sector; Rainwater Harvesting Wastewater treatment Desalination Increasing Efficiency of irrigation technologies Greywater Reuse Raise Public Awareness
Jordan's Intended Nationally Determined Contribution (INDC)	2015	The project is well aligned with some of the adaptation measures for the water sector listed in the INDC: Reducing water losses in distribution pipes; Introducing water saving technologies such as low-flow toilets and showers, and efficient appliances; Collection of rainwater for gardens, toilets, and other applications; Promoting water saving by awareness campaigns. Improving wastewater treatment plants (WWTP); Recycling wastewater; Increasing public awareness to water related issues;
The National Climate Change Policy of the Hashemite Kingdom of Jordan (2013-2020)- Sector Strategic Guidance Framework	2013	National Climate Change Policy, published by the Ministry of Environment of Jordan, aims to achieve a pro-active, climate risk-resilient Jordan, to remain with a low carbon but growing economy, with healthy, sustainable, resilient communities, sustainable water and agricultural resources, and thriving and productive ecosystems in the path towards sustainable development. 8 of 14 Climate Change Policy are designated for a Resilient Water Sector This Policy will provide guidance to the Government of Jordan to implement the major climate change objectives of national priority related to adaptation The project is aligned with numerous adaptation measures listed as follows: **Water Sector:** Further mainstream climate change consideration in water sector strategies, policies, and planning documents on all levels; Address the use of treated/recycled wastewater in the regulation/ directives on the demand-side such as grey water as part of codes and regulations for buildings including, high-rise and high-density buildings; Improve the domestic water distribution networks, including reducing water losses and energy efficiency in pumping; Develop proposals for adaptation in the water sector for financing from international climate change adaptation funds **Agricultural/food security and production:** Develop a comprehensive insurance system for agriculture; Permaculture. Promote water use efficiency in agriculture.
Climate Change Technology Need Assessment Project of Jordan (TNA)	2017	The Report outlines all the adaptation technology options available for water sector in Jordan and prioritized them based on most cost-effective, sustainable and socially acceptable options. It also highlighted the main barriers to adopting each of these technologies that should be addressed. The top three adaptation technologies for water sector include rainwater harvesting; water users association; and desalination/brackish water treatment and re-use.

		The AF project is in line with TNA plan which has selected water and agriculture as two of Jordan's most significant adaptation sectors.
NAP	(Forthcoming in 2020)	
National Development strategies / plans		
Jordan 2025- Part 1 Jordan 2025- Part 2	2015	This document (Jordan 2025) represents a long-term national vision and strategy (framework) rather than a detailed government action plan. The vision acknowledged the impact of climate change in widening the gap between water supply and water demand. The project is aligned with the vision's objective to maximize the utilization of water and the reuse of waste water.
Jordan Economic Growth Plan 2018-2022	2018	The JEGP is comprised of economic, fiscal and sectoral strategies that outline the vision and policies pertaining to each sector published by The Economic Policy Council. The project is aligned with JEGPin terms of achieving water security through ; Integrating the management of water resources by increasing the quantities of water available and storage capacity of all the WWTP. Also implementing rainwater harvesting interventions Improving the quality of water and wastewater services. Supplying water for agriculture through replacing freshwater from surface and groundwater sources with treated wastewater from wastewater treatment plants Promote efficient use of water in irrigation and high-yield agricultural products. Adopt and publish an updated "Action Plan" to reduce water sector losse.
A National Green Growth Plan for Jordan (2017-2025)	2017	This NGGP seeks to understand what prevents Jordan from implementing the goals established in Jordan's current plans and strategies, and offers suggestions in the context of green growth for other aspirations that will help to futureproof Jordan's Vision. The plan identified water as one of main six priority sectors that provide coverage of key green growth issues and opportunities for Jordan. The project is aligned with the plan in terms of: Acknowledging that water sector presents a crucial challenge to Jordan and that climate change has exacerbated existing water security issues resulting in significant negative implications for social development. Promoting the reuse of wastewater Reallocate humanitarian funding towards more strategic interventions to boost to boost resilience and minimise environmental impacts of refugee communities e.g. microgrid renewable energy, water harvesting Implementing a water provision intervention which could take the form of a desalination plant, a dam or a form of water harvesting. Educate the locals and different decision-making bodies on value and scarcity of water and on making water-efficient project decisions
Environmental strategies / plans		
Strategic Plan of the Ministry of Environment in Jordan (2017-2019)	2017	This document addresses the programs and plans of the Ministry of Environment in Jordan during 2017-2019to ensure the continuation of the ministry's pioneer and pivotal role successfully, in light of the challenges that are surrounding the region, and the accelerated changes in recent years. The project is well aligned with one of the objectives of the plan which is to prevent and reduce the negative impacts on the environment caused by pollution & climate change.
The Aligned National Action plan to Combat Desertification in Jordan 2015-2020	2015	The project will contribute to achieving the objectives of this action plan through mainstreaming climate change in planning in the target areas and so strengthening the enabling environment to adapt to drought in these areas. .
The National Biodiversity Strategy and Action Plan (NBSAP) in Jordan 2015 - 2020	2015	The 2015-2020 NBSAP embraces a new vision for Jordan's biodiversity as follows: The project is specifically aligned with the objective regarding ecosystem services and climate change: through enhancing the national understanding of dryland ecosystem benefits to national resilience, economic sustainability and local livelihoods. This is mainly through increasing resilience to climate-induced drought.
Sectoral strategies / plans, especially related to water		
Jordan's National Water Strategy (2016-2025)	2016	This document represents the vision and reference of the water sector in Jordan, which sets the goals and objectives for the water sector and also provides an initial response to Jordan's commitment to the Global Sustainable Development Goals, ….highlighting the

		need for stronger intersectoral coordination and producing a National Water Master Plan, including Management Plans for managing water resources and water demand. The proposed project is generally well aligned with the adaptation to climate change measures. In addition, the project will contribute to reducing inefficient use of water as well as increasing water supply for irrigation.
Water Demand Management Policy 2016	2016	This policy addresses the management of water demands in all sectors, including municipal, industry, tourism, agriculture and other activities of national importance and lists a wide range of capacity building, institutional, economic and technical measures for demand management. The project is aligned with the policy in terms of: Maximizing the utilization of the available water and minimize water losses and conserve water resources, promote effective water use efficiency, to adapt with the challenge we face of water scarcity in order to reduce the gap between supply and demand. It supports the achievement Updating codes and technical regulations periodically to ensure the installation of Rainwater harvesting systems in new construction (residential, commercial, industrial, tourism, etc.) where the size of the storage tank that depends on average rainfall and the surface area of the building is considered within the construction code. Continue implementation the replacement of all inefficient plumbing fixtures, appliances and equipment with the latest most efficient models. Assist low income consumers to obtain water saving devices for free or stimulatory prices The introduction of best technologies and modern and advanced irrigation systems in terms of the efficient water use in agriculture Expansion in establishing water harvesting systems “dams, ponds, excavations" in all regions of the Kingdom especially in the highlands and desert areas that are suited for it, this water can be used in different purposes and agriculture in particular. Continue public awareness campaigns and water education through several means of communication and media focusing on water scarcity and spreading the culture of awareness and responsibility to protect the water sources and its efficient use
Surface Water Utilisation Policy	2016	This policy, published by MoWI as an integral part of National Water Strategy, aims to present in more details what is envisioned towards the maximum utilization and optimum use of surface water, its protection, its management, and propose measures needed towards successfully integrating all its components. Also it addresses the interactions between the different resources and with different qualities, especially treated wastewater, to reach the maximum amounts of supply fit for use and the optimal return per meter cube; the proposed project is aligned with the Surface Water Utilisation Policy in terms of: Maximizing the use of surface water to the greatest extent possible by increasing the storage capacity of dams, construction of new dams, and investment in rainwater harvesting in remote areas and from rooftops. Constructing water harvesting schemes (ponds and desert dams) in the Highlands. Increasing Jordanians’ awareness of water scarcity and the importance of conserving and protecting Jordan’s limited water resources. The quality of treated wastewater from all municipal and industrial wastewater treatment plants shall comply with Jordanian standards, monitored regularly, and reviewed periodically.
Jordan’s Decentralized Wastewater Management Policy (2016-2025)	2016	This Policy is an integral part of the Jordan’s National Water Strategy that was published by MoWI. One of its key objectives is to seek measures to adapt to the increasing pressures from climate change on public sewer and wastewater treatment facilities. The project will follow the guidelines for wastewater reuse in all the interventions related to greywater and wastewater reuse.
Water Substitution and Reuse Policy (2016-2025)	2016	The Water Substitution and Reuse Policy, an integral part of the Jordan’s National Water Strategy published by MoWI, aims at substituting freshwater with treated wastewater and possibly other non-conventional water sources, avoiding negative impacts on water and soil quality, and which also refers to the principles of IWRM. The project is well aligned with the main objectives of this policy which are: To cope with the scarcity situation by enhancing the efficiency of the management of the scarce water resources in Jordan through maximizing the benefits and returns, and proposing actions required for implementation. To Increase the amounts of treated Wastewater (WW) and considering it as a potential water and revenue source To ensuring sustainability and preservation of water resources.

Water Sector Capital Investment Plan 2016 – 2025	2016	This plan, which is an integral part of the Jordan's National Water Strategy published by MoWI, defines its main aim as the sustainable development and management of water resources. The proposed project is well aligned with the two key focus areas of the plan that are essential to respond to Jordan's increased water scarcity; [1] The development of new water resources by implementing rainwater harvesting systems and encouraging reuse of treated wastewater and greywater [2] The expansion of wastewater treatment services.
Water Reallocation Policy (2016-2025)	2016	This policy, which is an integral part of the Jordan's National Water Strategy published by MoWI,prioritizes and re-allocates water from different sources (e.g. groundwater use considering safe yields) between the different sectors and governorates according to adaptive capacity, and at the same time at reducing non-revenue water. The proposed project is well aligned with the policy in term of: Maintaining acceptable water quantities for different areas and excellent water quality Frequency of water supply during summer and winter by implementing rainwater harvesting system Collecting and treating wastewater for safe agricultural use.
National Strategy for Agricultural Development 2016-2025(In Arabic)	2016	The National Strategy for Agricultural Development 2016-2025 stated that among challenges facing the agricultural sector is desertification in Jordan, which is increasing due to climate change, overgrazing and poor agricultural practices. The project is aligned with the strategy in terms of increasing the efficiency of water use in irrigation and the use of non-traditional water resources such as greywater.
Land use plan 2007	2007	Comprehensive plan designating the land use throughout the Kingdom. This Master Plan is distinctive in that it is a directive map illustrating the natural, geographic and demographic characteristics, including the sustainability of natural resources. The plan aims to: Preserve agricultural lands, ensure its continuity, and its development. Control the arbitrary urban sprawl Limitation of urban development based on natural features and actual needs Protect the environment from pollution.
Water for Life Jordan's Water Strategy 2008-2022	2008	This document is Jordan's vision for a water strategy published by MoWI prior to the National Water Strategy, where it emphasis on the fact that Jordan must manage its water resources giving priority to municipal and industrial needs and cap agricultural use. The proposed project is well aligned with the strategy in terms of; Increasing awareness among the Jordanian public and decision makers to seek behavioral change and lay the foundation for policy change. Policy and Regulation change and enforcement in the municipalities.
The National Strategy for Health Sector in Jordan 2016-2020	2015	This strategy represents the general framework for developing and strengthening the capacity of the health system to face the challenges and raise Jordan's leading position in the provision of health care. The threats include climate change impacts on health. In the context of this project, community consultations in most of the target areas have shown that there has been an increase in diseases due to climate change.
Jordan Response Plan for the Syria Crisis 2018-2020 JPR 2018-2020 Annex	2017	The project is well aligned with sector specific objectives under Environment and WASH Sectors as per the details below: Environment sector: SSO1: Improved mechanisms to mitigate pressure and competition for ecosystem services (land, water) resulting from refugee influx Wash sector: SSO1: Quantity, quality and efficiency of safe drinking water delivery improved and system optimized. SSO3: Strengthened sector planning, implementation, monitoring and coordination. SSO5: Sustainable provision of safe and equitable access to water services in host community as per min standards.
Sub-national plans		
Irbid 2030: Greater Irbid Area Plan	2010	A growth plan that is designated to n provides an overall land use plan and associated policies that direct growth within an urban–rural development concept.The overall strategy of the Plan is to integrate land use, infrastructure and transportation planning. The components of the plan cover 7 subjects and recognize Infrastructure, where the consumption of water and energy and production of waste and heat are inextricably connected to urban infrastructure systems.

		The proposed AF project is well aligned with the infrastructure guidelines related to water and wastewater in terms of; Increase wastewater treatment plant capacity to accommodate the expansion of the service area. Encourage treated greywater to be used for irrigation purposes.
http://mopالبرنامج.gov.jo/EchoBusV3.0/SystemAssets/pdf/govmap/%D8%A7%D8%B1%D8%A8%D8%AF 30-3-التنموي2017.pdf http://mop.gov.jo/EchoBusV3.0/SystemAssets/pdf/govmap/%D8%A7%D8%B1%D8%A8%D8%AF 30-3-لمحافظة2017.pdf http://mop.gov.jo/EchoBusV3.0/SystemAssets/pdf/govmap/%D8%A7%D8%B1%D8%A8%D8%AF 30-3-اربد2017.pdf 2019- 2017 (Development Program for Irbid Governorate 2017-2019_Agriculture and Water Sectors)	2017	The project is aligned with a number of proposed interventions by the municipality and the community including rainwater harvesting and rehabilitating water networks. Upscaling wastewater services through rehabilitation of the existing ponds and upgrading the capacity of WWTPs Encourage the usage of treated grey water for irrigation purposes.
http://mopالبرنامج.gov.jo/EchoBusV3.0/SystemAssets/pdf/govmap/%D8%A8%D8%B1%D9%86%D8%A7%D9%85%D8%AC	2017	The project is aligned with some of the proposed interventions in the agriculture sector including rehabilitation of water harvesting ponds. Improving the efficiency of residential, manufacturing, commercial and agricultural water supply systems through rainwater harvesting and rehabilitating water networks. Upscaling wastewater services through rehabilitation of the existing ponds and upgrading the capacity of WWTPs. Legislation development

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Table 10: Lebanon project alignment with National and sub-national priorities

Policy / Document	Year submitted / ratified	Relevant priorities
Lebanon		
Climate Change strategies / plans		
Lebanon's Nationally Determined Contribution	2015	This project aligns with the water related climate change adaptation priorities listed in the NDC: Rehabilitation of existing water networks Artificial recharge of groundwater aquifers Improving water efficiency and decrease water loss in irrigation Increasing wastewater collection and treatment Increasing water re-use, especially after wastewater treatment
Lebanon's third national communication to the UNFCCC	2016	The project is well aligned with some adaptation measures for the water sector listed in the report: Increasing the water-use efficiency of domestic, industrial, and agricultural sectors, Developing watershed-managed plans appropriate for expected changes in climate, investigating the feasibility of alternative sources of water supply, and improving the available information about Lebanon's water resources and water systems The report prioritized the installation of rainwater harvesting systems in agricultural greenhouses around different locations in Lebanon
Lebanon's Technology Needs Assessment project	2012	The Report outlines all the adaptation technology options available for the water sector in Lebanon and uses a criteria-based weighting system to prioritize the most cost-effective, sustainable and socially acceptable options. It also highlighted the main barriers to adopting each of these technologies that should be addressed. The report lists a number of water related solutions that the project aligns with. These include: Rainwater harvesting from greenhouses, hill lakes and rivers. Efficient water use irrigation systems Use of treated wastewater in irrigation
National Development strategies / plans		
National Physical Master Plan of the Lebanese	2005	The NPMPLT was endorsed by a decree issued by the Council of Ministers in July 2009. It is a strategic reference document that overrides all documents concerning regional and local urban development and planning. It is not only the framework for urban planning policy, but also serves as a guideline for all stakeholders participating in the national and land use development. The

Territory (NPMPLT)		NPMPLT tackles water resources management through land use plans and measures consisting of the following: Launching legislative and legal reforms that define the principles of land use Elaboration of several local urban plans with precedence to the zones threatened by urban linear expansion and agricultural lands jeopardized by urban structures. The report defines different challenges that Lebanon is facing today and might face in the future. One of those important challenges is wastewater management.
Disaster Risk Reduction strategies / plans		
UNDP –DRM Unit LEBANON Monitoring of Sendai Framework 2017	2017	The report outlines national updates on strengthening disaster risk management capacities in Lebanon. Target G5 of this report highlights the importance of disaster risk information through a national flood risk map. The project is in line with this target as it also aims to control floods in target areas.
Environmental strategies / plans		
Support to Reforms – Environmental Governance (StREG) Programme	2017	Main aims: increasing the effective capacity at the MoE to plan and execute environmental policy enforce environmental law mainstream environmental issues in key line ministries
The Practical Guide for Municipalities to Enhance Environmental Management (2017	2017	This report supports this project by presenting the problems that the municipalities face in the water sector, and the measures and actions that they can take to solve these challenges. It highlights all the laws and regulations related to water resources management as well as the roles of all stakeholders involved in that sector.
State and Trends of the Lebanese Environment	2010	This report provides an overview of the current condition of natural resources and environmental management in Lebanon. It gives an analysis of past and future developments across multiple sectors. It describes the impacts of rapid population growth, urbanization and climate change on water resources, then outlines the opportunities for improving the water sector. The project is in line with the selected responses presented in this report. Wastewater collection, treatment and reuse is one of the main opportunities presented in this report. Also, rainwater harvesting is outlines as another water resource augmentation option.
Sectoral strategies / plans, especially related to agriculture		
MoA/FAO Strategic Plan 2015-2019	2014	The strategy specific objectives are three-fold: I) To provide safe and quality food; II) To improve the contribution of agriculture to the economic and social development of the country; III) To promote the sustainable management of natural and genetic resources.
Sectoral strategies / plans, especially related to water		
National Water Sector Strategy (NWSS) 2010-2020		Environmental concerns: Climate change negatively impacting water resources The strategy is in line with the project since it aims at: Collection and treatment of at least preliminary levels of 80% of wastewater by 2015, and of 95% by 2020. Secondary treatment and reuse for all inland and for coastal systems where reuse is applicable by 2020. Irrigation and sanitation services through 16 initiatives involving institutional & organizational reforms and financial, commercial and environment initiatives, refining climate change knowledge on the water sector and preparing the sector for private sector participation.
Strategy for the Wastewater Sector (MoE)	2010	Presents a strategic roadmap to improving water sector infrastructure and management.
National Physical Master Plan of the Lebanese Territory	2005	It's the only national master plan that was drafted. It is not yet approved and implemented. The plan has predicted that there will be an increase in demand for water following population growth and increase of agricultural and industrial use of water.
Health Strategic Plan	2016-2020	Second Strategic goal set out by this plan is to improve collective public health through water and environmental controls.
Lebanese Crisis Response Plan (LCRP)	2017-2020	The LCRP is designed to: 1) Ensure humanitarian assistance and protection for the most vulnerable among persons displaced from Syria and poorest Lebanese; 2) Strengthen the capacity of national and local service delivery systems to expand access

		to and quality of basic public services; and 3) Reinforce Lebanon's economic, social, environmental, and institutional stability.
Sub-national plans		
Water Sector Lebanon - Bekaa governorate water supply (Map)	2017	Map showing existing water networks, wells and reservoirs in Bekaa governorate. It also highlights projects implemented or under construction.
Litani river basin management support program action plan for water resources awareness and enforcement (USAID)	2009-2014	Proposes an action plan aimed at improving the management of the Litani river through awareness projects that target schools, farmers and municipalities.
Water Sector Lebanon - Bekaa and Baalback El Hermel wastewater network (Map)	2015	Map showing existing wastewater networks and wastewater treatment plants in Bekaa and Baalbeck El-Hermel. It also highlights the most vulnerable localities in the two governorates.
Water Supply and Wastewater Systems master plan for the Bekaa Water Establishment	2015-2035	Report presents work related to the development of the Master Plan and the adoption of recommendations for the year 2035 for proposed action plans for water and wastewater sector in Lebanon.

E. Compliance with relevant national technical standards

The project fully aligns with national technical rules, regulations and standards, including those for environmental and social risks screening and impacts assessments, building codes, land use planning, water supply / harvesting / reuse, etc. Although proposed interventions don't require risks screening and impact assessment by national laws, accredited consultant have been hired in both countries to do this anyways to comply to AF ESP and GP requirements. Outputs include feasibility assessment report, EIAs report, National ESMP and consultation report. For more information see annex 4.

Jordan

Process to comply to national technical standards: compliance will be attained by:

1. Abiding with provisions of the governing Jordanian legal document (laws, by-laws, standards, codes, etc.) through conforming to the relevant rule(s);
2. In cases a permit is required from the authorizing entity to fulfil certain regulatory requirements, in which obtaining the permit entails following no standardized procedure, the project initiator will prepare an official letter addressed to the authorizing Ministry to obtain the approval. This is usually requested at preliminary phases of the projects. During the full proposal development phase, sub-projects proposals will be shared with the ministries to check if permits are needed.
3. If the permit is only issued based on a standardized procedure and a risk management tool is needed, the specific procedure will be followed based on the governing Jordanian Environmental Protection Law No. (6) of 2017 and Environment Impact Assessment Regulations of 2005, by-law or Instructions (i.e. ESIA permit based on Ministry of Environment-administrated ESIA Bylaw no. 37 of the Year 2005 will be obtained including developing an ESMP for activities that are required to develop an EIA, etc.). In all cases sub-project proposals need to be submitted to the Ministry of Environment to decide on the type of EIA required based on the EIA compliance process shown in the figure. This will be done during the full proposal development phase. A first screening shows that no EIA may be required as there is no mentioning of EIA requirements for water-project, except 'deep drilling and because no sub-project in the proposal entails substantial construction activities. For agriculture project, EIA are only required for cattle breeding farms.

Figure 9: EIA compliance process

A draft Local Administration Law, a new piece of legislation is currently being drafted by the government and sent to Parliament for debate. This law will replace the decentralization law and municipalities law. It governs and organize the work of the governorate and the city at local level and defines the responsibilities of local authorities, including for climate change. The idea is to empower local authorities and ensure that all the services are secured in each governorate by the local governorates/

According to the draft law, municipalities are fully responsible for managing stormwater, floods, and for coordinating with the concerned authorities in managing the distribution of water among the population, organizing its distribution, participating in identifying water network and working to prevent pollution of springs, wadis and wells. Municipalities are also responsible for coordinating with concerned authorities on establishing wastewater network.

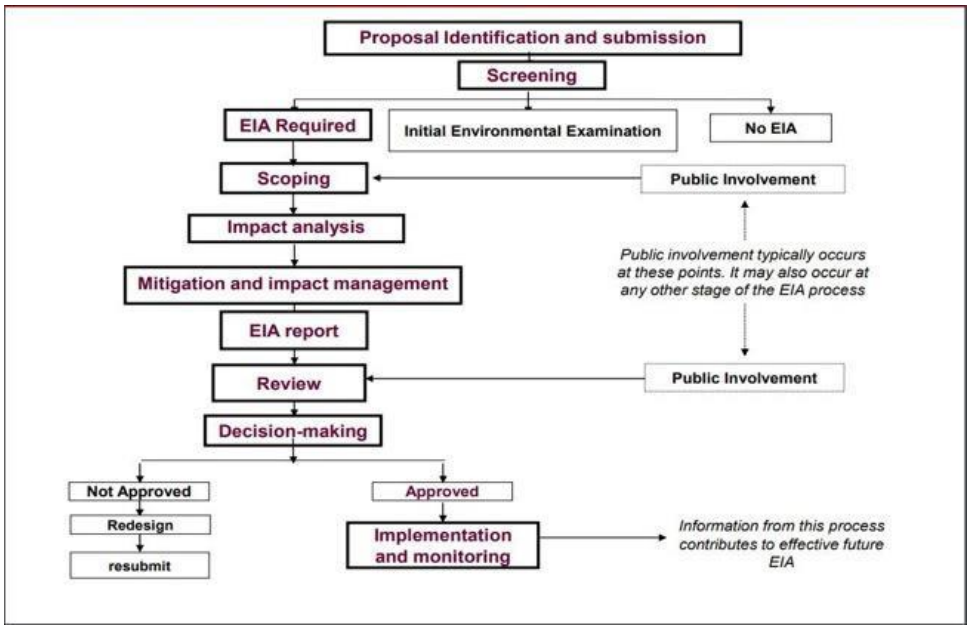


Table 11: Compliance with relevant national technical standards

Expected concrete output/intervention	Relevant rules, regulations and standards (to comply to AF principle 1)	Compliance procedure and authorizing offices
Output 1.3. Urban master plans at municipal level with CC and gender mainstreamed in Jordan	• Draft Local Administration Law • Cities, Villages and Buildings Planning Law and Amendments thereof No (79) for the year 1966 • Building, Villages and Cities Regulating by-law and amendments thereof for the year 2016 • Land Use Planning By-Law No. 6 of 2007 • Environmental Protection Law No. (6) of 2017	See compliance procedure above Required: coordination and approval from Municipalities of Irbid and Mafraq and Ministry of Local Administration – MoLA for Land use-related affairs and strategies
Output 2.1. Community organisation, awareness and capacity / skill building + operation, maintenance and replication and upscaling plans for concrete adaptation output 3.1 2.2. See above for output 3.2.	Not relevant	Operation, maintenance and replication will be coordinated with responsible ministries, municipalities and other entities

2.3. See above for output 3.3. 2.4. See above for output 3.4. 2.5. See above for output 3.5. 2.6. See above for output 3.6. 2.7. See above for output 3.7. 2.8. See above for output 3.8 2.9. See above for output 3.9		
Output 3.2. Rooftop rainwater harvesting in Jordan 3.3. Greywater treatment and reuse in Jordan 3.5. Efficient treatment and reuse of wastewater in Jordan 3.7. Water-use Efficient irrigation of treated wastewater in Jordan 3.8. Permaculture demonstration - closed loop water system in Jordan	Environmental Protection Law No. (6) of 2017 EIA Rules, regulations, standards (EIA By-law no. 37 of the Year 2005) (see above) The Jordanian Standard for Reclaimed Domestic Water – JS No. 893/2006 JS:286/2015: Water – Drinking Water, mandatory regulations Water and sanitary wastewater building code, Jordan National Building Council Jordanian National Building Law No. 7 of 1993 and recent Amendment Law No. 24 of 2018 The By-Law of Buildings and Organization of Cities and Villages and its Amendments No. 2 0f 2018 Jordan Green Building Guide Instructions No. G/7 for the Year 2016: Instructions and Conditions to Use Treated Wastewater, Salty Water, and Brackish Water for Agricultural Use Law No. 13 of 2015 concerning Agriculture Law.) Bylaw No. (133) of 2016 Organic Agriculture bylaw Issued pursuant to Articles (7) and (71) of Agriculture Law no. (13) of 2015)	See compliance procedure above EIA rules, regulations, standards and procedures have been followed and EIA, ESMP and consultations reports have been produced and are being approved by the Ministry of Environment (although no EIAs were required by national law (see annex 4) See compliance procedure above Required: coordination with and approval from target municipalities and ministry of water and irrigation for 1) construction harvesting and grey water systems; 2) water quality compliance for toilets and gardening) See compliance procedure above Required: coordination with and approval from ministry of water and irrigation and ministry of environment See compliance procedure above Required: coordination with and approval from ministry of water and irrigation, ministry of agriculture and ministry of environment
Output 4.2. Jordan and Lebanon KM with focus on project progress, best practices and lessons learned 4.4. Incentive mechanism (financial) and regulatory framework to replicate and upscale rainwater harvesting activities	Not relevant	Not relevant

Lebanon

The institutional framework for the water sector in Lebanon is managed by a number of ministries, water establishments, public agencies, municipalities, etc., as per below.

Table 12: Key players and responsibilities in the water and wastewater sectors

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

Source: State and Trends of the Lebanese Environment, 2010

Figure 10: Legal environmental requirement for any project activity in Lebanon[100]

Table 13: Compliance with relevant notional technical standards

Expected concrete output/intervention	Relevant rules, regulations and standards (to comply to AF principle 1)	Compliance procedure and authorizing offices
Output 1.1. Territorial planning and development strategy / guidelines with CC and gender mainstreamed in Lebanon 1.2. Urban master plans at municipal level with CC and	The Urban Planning decree-law of 1983: Article 4 to 17: plans, regulations and relevant planning conditions and possibilities. Article 18 to 24: operational arrangements that governments can use when undertaking a development project. Article 25 to 44: building permits and land subdivision.	See compliance procedure above Required: coordination and approval from target Municipalities and Ministry of Interior and Municipalities; Ministry of Environment; Directorate General of Urbanism (DGU);

[100] http://www.lb.undp.org/content/dam/lebanon/docs/Energy%20and%20Environment/Publications/20171218%20Environmental%20safeguards%20EN.pdf

gender mainstreamed in Lebanon	Municipal Law decree 118/77: Article 11: masterplans and regulations should be submitted to the relevant municipalities. Article 49: an urban plan should be approved jointly by the Directorate General of Urbanism (DGU) and the concerned municipality. Environment Code, Law 444/2002.	
Output 2.1. Community organisation, awareness and capacity / skill building + operation, maintenance and replication and upscaling plans for concrete adaptation output 3.1 2.2. See above for output 3.2. 2.3. See above for output 3.3. 2.4. See above for output 3.4. 2.5. See above for output 3.5. 2.6. See above for output 3.6. 2.7. See above for output 3.7. 2.8. See above for output 3.8 2.9. See above for output 3.9	Not relevant	Operation, maintenance and replication will be coordinated with responsible ministries, municipalities and other entities
Output 3.1. Rooftop rainwater harvesting in Lebanon 3.4. Efficient treatment and reuse of wastewater in Lebanon irrigation of treated wastewater in Lebanon ~~3.6. Water-use-efficient irrigation of treated wastewater in Lebanon~~ 3.9 Permaculture demonstration – closed loop water system in Lebanon	decree 8633 MoE, 2012, Annex 1 Law 221/2000 (amendment 241/2000) and law 77/2018: Water Code Water Code–Law 77 Water and Wastewater masterplan for the Bekaa Governorate 2015 National guidelines for rainwater harvesting systems prepared by MoEW based on potable water standards. Law 221/2000 (amendment 241/2000) and law 77/2018: Water Code Water Code–Law 77 Water and Wastewater masterplan for the Bekaa Governorate 2015 ~~No guidelines for drip irrigation installation exist.~~ Experimental stations at LARI have relevant experience for testing new crop varieties. No national standards for irrigation water quality. FAO standards will be adopted.	See compliance procedure above. According to Decree No. 8633,2012 of MoE, the following steps were taken: -A screening form for the project and sub-project was submitted -A public consultation was held on December 18th 2019 -A scoping report was submitted to MoE on December 30th 2019 -The EIA report is the final step of the EIA process. It was submitted on January 13th following the reply of MoE on scoping report. -An additional EIA study will be prepared for amended output 3.4 See compliance procedure above; Design of rainwater harvesting system follows the guidelines. Consultation with MoEW. No Required: coordination with and approval from target municipalities and Ministry of Energy and Water for 1) construction harvesting and grey water systems; 2) water quality compliance for toilets and gardening) See compliance procedure above Required: coordination with and approval from Ministry of Environment; Ministry of Energy and Water; Bekaa Regional Water Establishment; Litani River Authority; target Municipalities; Ministry of Agriculture; All testings and approvals will be the sole responsibility of UNICEF in coordination with LARI – affiliated to

		the Ministry of Agriculture (MoA). The educational facility established by UNICEF will develop a curriculum in coordination betweenLARI and the Ministry of Education and Higher Education (MEHE)
Output 4.2. Jordan and Lebanon KM with focus on project progress, best practices and lessons learned 4.3. Sub-national KM and Regional' urban risks and vulnerabilities assessment, planning and management approach model for type 2 cities	Not relevant	Not relevant

F. Duplication with other funding sources

The project will avoid geographical overlap with other projects and complement existing project and use lessons learned where possible. During the project preparation phase, all projects in the target areas and have been mapped to avoid geographical overlap. Besides that, similar project in Jordan and Lebanon and in the region have been identified with the purpose to extract lessons learned and integrate those in the project. An overview of all these projects, has been included in a table 14 below. This has been done through desk research, consultations (see Part II.I) but also by requested inputs from ministries and execution entities, who lead similar projects before(e.g. UNICEF as executing reliable partner with a wealth of knowledge and vast experience regarding WASH in the region with focus on supporting vulnerable populations and strengthening local systems and institutional setups).[101] The same accounts for JOHUD and rainwater harvesting, the Water Authority of Jordan if it comes to wastewater treatment in Jordan. The Permaculture Research Institute is worldwide known institute if it comes to permaculture. UN-habitat will also work with universities and consultancy firms to further develop business cases and incentive mechanism for water harvesting options (output 4.4) and Permaculture (output 3.8). UN-habitat will continue to coordinate with all relevant stakeholders during project implementation to ensure synergies with other (potential) project, also through steering committee meetings.

[101]UNICEF leads the humanitarian WASH sector since the beginning of the Syrian refugee crisis. With the aim to ensure adequate and safe water and sanitation to both host and refugee communities with a specific focus on vulnerable children and women. UNICEF has been involved in humanitarian WASH response [water trucking, wastewater desludging, WASH awareness campaigns, etc.], and 'stabilization' projects [communal water tanks, large infrastructural networks upgrade, water and wastewater treatment activities, etc.] in close collaboration and partnership with the Ministry of Energy and Water (MoEW) and the regional water establishments. Through its partnerships, UNICEF supported in updating the Water Sector National Strategy with a focus on climate related challenges and provided capacity building to national and sub-national authorities that led to the development of human, planning, and infrastructural resources. At the present time, UNICEF aims at ensuring adequate quantities of clean water to vulnerable communities especially due to the current economic and financial crisis affecting Lebanon. Accordingly, UNICEF is leading the Emergency Response Plan (ERP) to support water service providers to continuously supply water to all.

Table 14: Duplication with other funding sources

Relevant projects and focus	Relevant focus and interventions / activities	Lessons learned	Complimentary potential and non-duplication (see also consultation section)
Global			
'Urban permaculture' by UN-HABITAT's Cities and Climate Change Initiative in in Esmeraldas, Ecuador	Promoting resilient communities in the face of highly probable future food and energy crises and the collapse of water and sanitation services due to Climate Change The project tries to mimic Nature and its ecological cycle with the following components: urban agriculture and healthy food, rainwater harvesting, water recycling, solid waste recycling, and dry toilets.	Greening of urban habitats and environments while harvesting water and producing food have been demonstrated; Permaculture can be used as a climate change adaptation measures in an urban context	Complementary Use lessons learned and further develop the concept in urban context for target area (through desk research) Non-Duplication In Ecuador
MENA region			
UN-Habitat – with AF funding – Enhance water and livelihood security and social cohesion through adaptation in Syria's Barada watershed (concept to be submitted) – USD 10 million	The protection of water resources (and prevent contamination of surface and groundwater resources / wells) The reduction of water losses; The increase of water use efficiency, supporting water harvesting projects and using high efficiency irrigation methods; The promotion of use of non-conventional water resources (e.g. treated wastewater) and: Improved agricultural production practices (e.g. drought tolerant crops).	Project proposal under development.	Complementary Align approach and lessons learned throughout project preparation and implementation (by ROAS) Non-Duplication In Syria
IFAD with AF funding - Building Resilience of the Agriculture Sector to Climate Change in Iraq (2018-2023) – USD 10 million	Capacity development to integrate CC adaptation and risk reduction into agriculture planning and production systems Climate-resilient Agriculture Investments	Has not started yet Monitor lessons during project formulation phase	Complementary Consider similar approach to capacity building and efficient water supply from tertiary canals up to farmland plots is secured based on climate- proof systems and technologies. ROAS to contact IFAD Non-Duplication In Iraq
FAO Water Scarcity Regional Initiative (WSI)Pursuing food and water securities in MENA region	Establishing community-farm demonstration fields to show the benefits of new irrigation technology Implementing a plan to envision future climate change scenarios for 'hotspots' at the regional level	Monitor results (which are not publically available yet)	Complementary Potentially complement results related to new technology. ROAS to contact FAO Non-Duplication Regional, including Jordan and Lebanon. No overlap with target areas
FAO Dutch-funded Sanaa Basin Project in Jemen(2014-2017) Water sustainability for farmers while empowering women	Construction of wells through a cash-for-work formula for farmers to use for agricultural production. All Water User Associations choose their board members through elections and 30 percent of the seats are designated for women.	Water association and women only access to water can be used as a water management system to reduce conflict between tribes	Complementary Consider building upon lessons from Water association and women only access to water approach and cash-for-work formula for farmers to use for agricultural production. ROAS to contact FAO Non-Duplication In Yemen
UN-Habitat Sustainable, Inclusive and Evidence-based National Urban Policies in selected Arab States (2015-2020)	Development of a National Urban Policy (NUP) clarifying the mandates of sub-national governments, especially municipalities, in the governance system Particular focus on mainstream climate change in the NUP	There is much interest in enhancing responsibilities of municipal, esp related to climate change. Part of this is to set-up and run urban observatories	Complementary This project will complement the NUP formulation process through setting-up and running of urban observatories to

	process and engage stakeholders in the key climate change issues to be incorporated in the National Urban Policy of Jordan and Lebanon		collect and handle climate change data Non-Duplication No Geographic overlap
Jordan			
CVBD The Jordanian Municipal Observatory	CVBD is implementing a national project to establish municipal observatory in all 100 municipalities to provide reliable and comprehensive database that inform policy and decision making process. The project aims to strengthen the relationship with local authorities and improve the developmental and service- oriented work of municipalities. The data form was prepared and indicators were selected. The CVDB is now validating data and reviewing it and embarking on developing a national portal. CVDB is guiding the whole process and will be establishing the whole system at national level to which all municipalities will report.	An initial revision of the data form suggests that there is a need to review selected indicators and localize SDG 11 and 13 through municipal observatories and include indicators related to climate change and sustainable cities that could inform the development of municipal plans and help to sustain it.	Complementary • The project will complement the CVDB national initiative and focus on Irbid and Mafraq and set up a pilot municipal observatory in both municipalities with specific emphasis on climate change. • The project could also contribute to the development of guidance book on climate change data collection, analysis and reporting. Non-Duplication CVDB has no major activities in Irbid and Mafraq yet.
Jordan government with AF funding - Increasing the resilience of poor and vulnerable communities to climate change impacts in Jordan through Implementing Innovative projects in water and agriculture in support of adaptation to climate change[102] (2015-2018) – USD 9,2 million	Waste water treatment plant + monitoring quality Irrigation study Rain/flood water harvesting dam / basin (400.000 m3) with solar panels to reduce evaporation Permaculture – adaptation + ecosystem management in demonstration sites	According to manager Permaculture has promising results for adaptation, reducing pollution and protecting ecosystem Water user associations / cooperation can be used to reach farmers and administer water	Complementary Use permaculture concept in real farms and in urban context Use similar approach for water harvesting basins at farms and in urban areas Water user associations / cooperation can be used UN-Habitat is already in touch with manager and specialists (see also II.I) Non-Duplication In Jordan Valley
UNICEF WASH programme	Supports the Ministry of Water and Irrigation and partners in the Water Sanitation and Hygiene (WASH) sector at three different levels Leading the emergency WASH sector coordination Ensuring access to safe water and sanitation facilities and services in refugee camps and in host communities, and strengthening the Government's capacity to prioritize, plan, implement and monitor.	In host communities, leakage along the water network results in huge losses (up to 60 per cent in some areas) and inefficient operation modalities.	Complementary UNICEF has been consulted to better understand their approach and local needs Compliment UNICEF work (emergency / humanitarian) by supporting sustainable and climate change resilient interventions UNICEF will be executing partner Non-Duplication Through coordination with UNICEF, overlap is avoided; UNICEF mainly focused on piped water
UNICEF - Water Conservation in schools Grey Water Reuse and storm water drainage system	In 2018, a proposal was made to UNICEF to pilot grey water reuse system in four schools to introduce water conservation and reuse in Zaatari refugee camp. The main activities of the project:	Water sampling and testing to ensure system efficiency.	Complementary UNICEF has been consulted to better understand their approach. UNICEF will be executing partner

[102] https://reliefweb.int/report/jordan/planning-ministry-launches-9-2million-project-adaptation-climate-change

	Reuse the grey water produced by the school for irrigation for no edible groups and flushing purposes Reduce the public health risk and impact on local ground water aquifers from the discharge of untreated grey water. Provide alternative solution for reducing the cost of desludging and network operation in Zaatari camp. Minimize the operation and maintenance costs. Raise the awareness among the students on the proper use of water reuse		Non-Duplication In Zaatari Camp
USAID Hydroponic Green farming Initiative (2015-2017)	The USAID Hydroponic Green Farming Initiative aims to introduce a model that integrates hydroponic farming and renewable energy generation for large commercial farms and small rural households. The greater focus will be on; Promoting hydroponic technology in established farmer networks and targeted communities. Demonstrating the feasibility of hydroponics. Bridging the gap between traditional agricultural knowledge and hydroponic systems through educational material and training exercises. Ensuring prospective farmers have the technical knowledge and funding to access hydroponic technology. Focusing on vulnerable demographics – such as women and youth – when designing outreach and dissemination activities.	Hydroponic can be scaled up as a climate change adaptation measures in Jordan Improve water efficiency in agriculture through hydroponic systems that use significantly less water than traditional farming practices.	Complementary Potentially complement results related to new technology and water efficiency Will be further consulted Non-Duplication In Jordan Valley and highlands. No overlap with target areas
USAID - Community Water Harvesting Systems (in Mafraq and Karak)	The project highlights: The application of simple, low cost, and scientifically based water harvesting systems in 4 sites in Mafraq and 2 in Karak. The utilization of harvested water for agricultural production.	Make sure of the availability of active community organizations with resources available for the project such as land and farms	Complementary: Use the mentioned Guideline for selecting and sizing water harvesting system Non-Duplication In Mafraq and Karak, however no overlapping with the selected targeted schools in Mafraq.
USAID Mercy Corps - Community-Based Initiatives for Water Demand Management I (CBIWDM I) and II (CBIWDM II)	The goal of the initiative is to reduce the social and economic impacts of water resource limitations, as well as responding to the destabilizing effects in Jordan on the water and sanitation sectors caused by the influx of Syrian refugees. The main activities/interventions, to enable rural Jordanian communities to reduce water demand through improved resource management, are as follow: CBO Capacity Building Program Construct rainwater harvesting reservoirs with water catchment systems responds to the immediate need of water and provided a convenient resource Awareness Campaigns at Schools that complement the construction work of rainwater harvesting cisterns implemented at the schools. One of these campaigns is **"For all of us" Campaign (إننا كلنا)** The initiative provide network support to the Yarmouk Water Company through the provision of emergency equipment, infrastructure works for improved water supply, and outreach and customer service support to YWC.	Conducting leak detection and repairs for municipal water systems to increase water delivery/availability.	Non-Duplication In all 12 governorates, however ,no overlapping with the selected targeted area.

	Promote equal access to resources through the empowerment of different water users requires that there is at least one woman on the management committees for each CBO		
JOHUD - The Arteries of The Nation: Repairing Jordan's Water Networks (WRAP) Project	The project was initially developed in 2015 to preserve Jordan's slim water resources, and to provide adequate water resources to the populations. It focused on; Revitalise the springs that provided the local farms with water for crop irrigation in collaboration with Madaba Water Authority Improve quality and quantity of the drinking water helping to improve the health and wellbeing of around 20,000 local residents Repair canals and providing more reliable sources of irrigation water Reduce local household electricity bills, because they no longer using electric pumps to fill the rooftop water tanks.	Water Authority managers were able to determine and measure the real needs and demands in the community.	Complementary Help the targeted areas to retain its agricultural character JOHUD will be one of the executing bodies Potential similar results regarding the rehabilitation and upgrading the WWTPs. Non-Duplication Ma'een District, in Madaba Governorate
The Hashemite Fund for Development of Jodan Badia - Treated Waste Water Reuse Project – Wadi Mousa	The first community-based project was established in collaboration with the USAID. The local community was provided with technical support to use treated and reclaimed wastewater for irrigating their fodder crops. Improve the livelihoods of local community members in the target area. Reduce the competition on and demand for fresh water resources. Conserve natural resources and better manage the environment through the reuse of reclaimed water. Develop drip irrigation systems for an area of 100 hectares.		Complementary source of income for the local community members Badia Fund will be one of the executing bodies Non-Duplication Wadi Mousa, Jordan
GIZ – improvement of community water efficiency through cooperation with religious authorities	Religion-based teaching materials are developed for schools and universities and then included in religious education to raise awareness of the issue of water scarcity. Equipping selected mosques in northern and central Jordan with rainwater collection and grey water recycling systems.	It is important to raise awareness of religious leaders and education experts on the issue of water scarcity at mosques and schools to serve as serve as water ambassadors.	Complementary Potentially complement efforts related to water efficiency and harvesting in Mosques and Schools. UN-Habitat is already in touch (see II.I) Non-Duplication Northern governorates. Through coordination with GIZ, Ministry of Water and Irrigation, Ministry of Awqaf, overlap is avoided.
FAO Project- Reduce Vulnerability in Jordan in the Context of Water Scarcity and Increasing Food/Energy Demand	The project pilots a three-pronged, community-based approach, combining water harvesting, conjunctive use of groundwater, and solar power for lifting irrigation water. Downstream water harvesting in Al-Ghadeer Al-Abyad watershed site Rehabilitation of Al Ghadeer Dam Installing PV system to pump water from the dam to nearby agricultural lands. Assessment of the water harvesting sector in Jordan which will serve as an important input into the development of a sub-sector strategy for water harvesting.	Focus on the creation of a comprehensive policy framework for water harvesting to promote the more efficient use of water resources as well as to better integrate agricultural production policies with the water harvesting efforts.	Complementary Potentially complement efforts related to upstream water harvesting. UN-Habitat is already in touch (see II.I) and intervnetions will be well coordinated Non-Duplication Al Mafraq Governorate, around Al Mafraq WWTP. Through coordination with FAO, overlap is avoided.

Permaculture Gardens for schools project Al Jawaseri School Garden project	Al Jawaseri is a permaculture school garden in a hyper arid landscape in the Jordan Valley. A Collaboration between the Permaculture Research Institute of Australia and Kids Are Sweet International. The project enables children in a small village with severe water shortages to learn how to build soil, maximise water retention, and create garden abundance. They focused on; Design a hyper-arid garden Local women empowerment, where the implementation of the project was directed by local women residents Establishment of self-replicating educational demonstration sites across the globe	Use sunken beds lined with builders plastic to retain all the water from drip irrigation. Very successful project to promote permaculture everywhere.	Complementary Potentially upscaling this project into some vocational schools in the targeted areas Non-Duplication In Jordan Valley, Jordan
Lebanon			
UNHCR Water, sanitation and hygiene programme	UNHCR's strategy on water, sanitation and hygiene (WASH) is aimed at helping both refugees and the Lebanese communities hosting them. It targets the needs of refugees in informal settlements, as well as refugees living in Lebanese communities, through the implementation of water and waste water projects that strengthen and/or rehabilitate existing infrastructure. Rehabilitation of storm water channels to the construction of reservoirs, and even the drilling and equipping of boreholes. Nine water supply systems in the Bekaa and North Lebanon are being rehabilitated	Crucial to support both DPs and host communities.	Complementary UNHCR has been consulted to better understand their approach and local needs Use lessons learned for supporting both DPs and host communities, while adding the climate change component UN-Habitat is already in touch (see II.I) Non-Duplication Through coordination with UNHCR, overlap is avoided
UNICEF WASH programme 2013–2016	Three components: Update the Water Sector National Strategywith a focus on climate related challenges; Strengthen the capacities and information systems of national and sub-national authorities in Lebanon (developing human, planning and infrastructural resources); Improve and ensure safe and adequate access to WASH services for both host and refugee communities (including displaced Syrians in ISs) with a specific focus on vulnerable women and children (WASH in Emergencies); Improve WASH infrastructure to ensure better service delivery to host communities (WASH in urban areas/stabilization interventions); Lead the Emergency Response Plan (ERP) to support water service providers to continuously supply water to all during the current financial and economic crisis.	Interventions should support national water plan / targets Different targeting strategies required (difference between urban and camp-based refugees) Requires flexibility	Complementary UNICEF has been consulted to better understand their approach and local needs. Compliment UNICEF's work (emergency / humanitarian) by supportingsustainable and climate change resilient interventions. UNICEF will be an executing partner. Non-Duplication Through coordination with UNICEF, overlap is avoided; mostly piped water.

UNDP Support to Host Communities in North Lebanon in the WASH Sector (2014-2017) – USD 8,8 million	Identification, implementation of water supply / storage works and commissioning and handover of works to North Lebanon Water Establishment	Lengthy process for licensing for works	Complementary Complement UNDPs work in target area while also supporting host communities UN-Habitat is already in touch (see II.I) Non-Duplication North of Lebanon
Lebanon Recovery Fund (MOE & UNDP)	Systems for rainwater harvesting from the top of greenhouses has been installed in three sites Choueifat, Kfarmashoun and Damour in Mount Lebanon. Collecting rainwater from the top of the greenhouses, storing it in big tanks to be used for irrigation during the dry months.	Farmers are saving all the money they used to spend on purchasing water for irrigation and on pumping. The groundwater quality will be protected from pollution and salinization, since pumping rate and depth will both decrease. Water quantity will be preserved as natural recharge CO2 emissions from energy consumed for pumping water will decrease.	Complementary Benefit from UNDP's guidelines destined for all Lebanese farmers to replicate these pilot rainwater harvesting initiatives. UN-Habitat is already in touch (see II.I) Non-Duplication Mount Lebanon
IFAD with AF funding Climate Smart Agriculture: Enhancing Adaptive Capacity of the Rural Communities in Lebanon (2013-2017) – USD 8 million	Water Management: Rainwater harvested from greenhouse roof tops Water Management: Water efficient irrigation systems deployed Adaptation Techniques Roll-out: Capacity building on adaptation techniques for vulnerable field crops enhanced and Guidelines and recommendations on agricultural adaptation techniques for vulnerable areas developed	Get guidelines	Complementary Consider similar approach to water harvesting and irrigation systems Will be further consulted Non-Duplication Target is Rural communities
World Bank - Greater Beirut Water Supply Project (2010 – 2020) – USD 370 million	Bulk Water Supply Infrastructure Supply Reservoirs, Distribution Network and Metering Project Management, Utility Strengthening and National Studies Land Acquisition and Resettlement Compensation		Complementary Increase the provision of potable water to the residents in the project area within the Greater Beirut region Strengthen the capacity of the Beirut Mount Lebanon Water Establishment in utility operations UN-Habitat is already in touch (see II.I) Non-Duplication Greater Beirut Area
World Bank – Water Supply Augmentation Project (2014 – 2024) – USD 617 million	Construction and construction supervision of the Bisri Dam and the associated access road. Construction and construction supervision of the conveyor pipelines to the existing Joun reservoir and the associated access road Two (2) hydropower plants Expansion of the Ouardaniyeh water treatment plant (WTP) Technical assistance to the Ministry of Energy and Water (MOEW), Beirut Mount Lebanon Water Establishment (BMLWE) and Council for Development and Reconstruction (CDR) on the operation and maintenance of dams; on management of water resources; in developing and implementing awareness raising campaigns on the economic benefits of switching to the public water network and eventual volumetric metering water supply	People will access to clean and improved water supply service without spending additional expenses on alternative water sources.	Complementary Increase the volume of water available to the Greater Beirut and Mount Lebanon area Capacity building to the Ministry of Energy and Water (MOEW) UN-Habitat is already in touch (see II.I) Non-Duplication Greater Beirut and Mount Lebanon Area
World Vision (applied projects based on Bekaa water and wastewater masterplans)	Taalabaya Water Network Replacement and Expansion project Rehabilitation of Waste Water Treatment Plant in Ablah Project for Waste Water Treatment for Bar Elias and Dakweh in Bekaa Area	Limit water trucking and informal water services Enhance water supply for vulnerable communities.	Complementary Support to Enhance Basic Infrastructure and Economic Recovery in Lebanon

			The use of treated wastewater for irrigation. Benefit from network expansion. UN-Habitat is already in touch (see II.I) Non-Duplication Follows the masterplan which is coordinated by the Bekaa Water Establishment.
CDR, national government with grant from Kuwait - Rehabilitation of water systems in West Bekaa and villages in East Zahle district - US$ 32.9 million (CDR report)	Drilling of two wells and equipping of the seven wells, building pumping stations in Shamseen, installation of pumping lines from these two stations to two central reservoirs on Mount Anjar and Mount Terbol; Construction of the two mentioned reservoirs in addition to a reservoir in Majdel Anjar and another in Sultan Yacoub al-Tahta and Construction of two local reservoirs in Jeb Jenin and Kamed el Laouz, installation of transmission line from these central reservoirs to local reservoirs in West Bekaa and East of Zahle villages, construction of transmission lines from the central reservoir in Baaloul to Jeb Jenin and Kamed el Laouz reservoirs and the distribution networks in both towns	No started yet	Complementary CDR has been consulted to better understand their approach and local needs Compliment CDR work (conventional water supply) by supporting sustainable and climate change resilient interventions UN-Habitat is already in touch (see II.I) Non-Duplication Through coordination with CDR, overlap is avoided
CDR, national government - Rehabilitation and improvement of potable water systems in Zahle and surroundings (CDR report)	Three tier project: Part 1: potable water networks in Haoush el Omara and Ksara (under USAID, US$ 5 million) Part 2: potable water networks in the city of Zahle which are fed from the potable water treatment plant; the cost of (Ministry of Energy and Water US$ 5 million) Part 3: potable water systems in East Zahle, Dhour Zahle, Touaite, Mouaalaka, Karak, Madina Sinaiiya, Qaa El Reem and Hezerta (US$ 16 million and is funded by the Kuwait Fund for Arab Economic Development, the budget of the Ministry of Energy and Water, the Lebanese Government and managed by the CDR.)	No started yet	Complementary CDR has been consulted to better understand their approach and local needs Compliment CDR work (conventional water supply) by supporting sustainable and climate change resilient interventions UN-Habitat is already in touch (see II.I) Non-Duplication Through coordination with CDR, overlap is avoided
The International Bank for Reconstruction and Development (IBRD): Lake Qaraoun Pollution Prevention Project (2016-2023)	Objective: reduction of sewage discharge into the Litani River and to enhance pollution management around Qaraoun Lake. Project components: Improvement of municipal sewage collection (IBRD -US$50.5 million, GoL-US$5 milion) Promotion of Good Agricultural Practices (including Integrated Pest Management) (IBRD-US$1.5 million) Solid Waste, Water Quality Monitoring, Capacity Building, and Project Management (IBRD-US$3 million)		Complementary This project takes care of waste management around the Litani river, thus waste management approach in proposed project is limited Non-Duplication Focused on waste management
AgriCAL- Climate Smart Agriculture: Enhancing Adaptative Capacity of the Rural Communities in Lebanon (2012-2017)	Goal of the project: increase community resilience and adaptive capacity to climate change in Lebanon Objective: implement climate change adaptation measures in the agriculture sector in three highly vulnerable focus areas: The four outcomes of the project are: Increased water availability and efficient use through water harvesting and irrigation technologies Increased adaptation to climate change for crop production Increased resilience of shepherds and small ruminants to climate change through sustainable rangeland management	Risk-coping agriculture techniques Initiating a pilot climate insurance index	Complementary Assist communities in adapting by improving water harvesting and irrigation technologies Introducing adapted crop varieties to future climate condition Spreading awareness of expertise and skills Will be further consulted Non-Duplication

	Climate index insurance initiated, policy influenced, and lessons learned and shared through a knowledge management system		Increase community resilience and adaptive capacity to climate change
UPLoAD, APIEU and Bekaa Water Establishment - Integrated approach for dealing with the water/urbanization problématique through the case of the city of Zahle and the Bedawni river watershed.	The idea is that in Lebanon there is little articulation - institutionally and scientifically - between urbanization management concerns (mainly defined in terms of urban development and land use management and led by local authorities) and water management concerns (mainly defined in terms of engineering adequacy of water resources and water demands and led by regional water establishments). This is problematic as, on one hand, urbanization and urban development have impacts on water flows, consumption and pollution. On the other hand, water resources are historically appropriated as local resources and integrated into local development initiatives (in agriculture, tourism and industry) and there is clear resistance to give its management to a sectorial supra-local authority (regional water establishment) especially as this authority does not concern itself with local development issues. In this context, their approach works on: Building a platform of stakeholders (including water sector actors (Bekaa Water Establishment, Ministry of Energy and Water, Litani River Authority), Zahle municipality, representatives of the industrial, agricultural and commercial sectors, etc.) where these issues are discussed and possibly information shared. Developing a number of synthesis studies that help understand the context. Working with the urban planning consultant mandated by the municipality of Zahle to draw its new Masterplan (including urban development orientations and land use zoning) to allow him to integrate the results of the studies (in 2)) in his Masterplan and sensitize him to water-sensitive urban planning and design approaches (including "ville perméable" and "sponge city" approaches) Through a participatory workshop, identify with stakeholders' possible projects/initiatives that would enhance urban water management in the city of Zahle Based on the workshop results and available funds develop a pilot project or prepare feasibility studies that could serve other projects	Ongoing (year two of project); Very limited budget funded; Difficult coordination with water stakeholders in the Bekaa region; Enlargement of water management scale to encompass different surrounding regions, since the watershed is common for other regions; Working through municipalities to enhance efficient climate resilient interventions within the municipal boundaries.	<u>Complementary</u> Water management WASH service delivery Agriculture and urbanization trends in Central Bekaa <u>Non-Duplication</u> Masterplan for Zahle
ReWater MENA managed by the International Water Management Institute and funded by SIDA http://rewater-mena.iwmi.org/	Regional project researching and promoting a safe reuse of treated wastewater in Lebanon, Egypt and Jordan. In Lebanon, it has three main components: A study assessing the Wastewater reuse potential at national level to inform government and decision makers on where and how wastewater can be reused and the associated constraints (technical, social, financial, institutional) Two specific studies around two respective WWTPs where reuse models will be designed in a participatory approach involving stakeholders at all levels. The outputs will be two models (technical, economic and management plans) ready to be physically implemented by the Government and donors. The Rewater MENA won't be implementing infrastructure.	Designing a wastewater reuse system is a complex endeavor as it entails a diversity of technical, environmental, economic, social and institutional factors. It should be carefully designed with the different stakeholders, especially plant operators and users. It should be guaranteed that The WWTP will continue operating, that water is of sufficient quality, that water is needed and wanted by farmers, that the system is economically feasible and socially accepted. Different scenarios of geographic allocation should	<u>Complementary</u> Adopting wastewater reuse guidelines especially in the target area Benefiting from existing coordination platforms <u>Non-Duplication</u> Applying wastewater reuse projects for both irrigation and crop improvement

	Support to the Lebanese Government in developing legal standards for wastewater reuse, based on the FAO Lebanese guidelines (2010). This is currently being done within a committee recently formed by LIBNOR which consists of different relevant ministries and other stakeholders (the meetings started in September 2019).	be considered and assessed with farmers themselves. If not, there is a risk that infrastructure won't be used. It also has to be politically accepted by the water administration. For example, the Litani River Authority did not want to use treated water in their irrigation systems.	
ELARD and UNDP – Provision of Services for the Development of Local Level Master Plans and Detailed Urban Plans in the Qaraoun Catchment. Draft Master Plan Report (April 3, 2019).	Based on the National Physical Master Plan for the Lebanese Territory recommendations, as well as on the detailed diagnostic of the study area that was prepared during the first phase of the project, this Master Plan for the Districts of Zahle, West Bekaa and Rachaya addresses challenges to be addressed at several levels including landscape, heritage and environmental, urban development structure, as well as economic development challenges.	No industrial activities in core zone New Urbanization not allowed Heavy industries to be relocated far from residential and agricultural areas The masterplan which is in line with the National Physical Master Plan for the Lebanese Territory (NPMPLT) classifies the study area into four zones: A (Agricultural), U (Urban), N1 (Peaks: high mountain above 1900m), and N3 (Valleys, quality forests and continuous ecological areas)	<u>Complementary</u> Continuation of the mapping exercise especially in landscapes and heritage, natural hazards, urban infrastructure and economic development challenges <u>Non-Duplication</u> Thorough studies on soil, land use, hydrogeology water sheds and climate related effects on various sectors
World Bank – Lebanon National Comprehensive Environmental Management Program (Phase I – Litani River Basin) – USD 200–250 million	The project aims to treat water pollution in the Litani River Basin and Qaraoun Lake. Beyond building and operating infrastructure, managing water resources is about adequate water use practices and coordination/participation mechanisms to solve water issues and conflicts pro-actively, and in an equitable and sustainable manner. The action plan entails activities that are cross-referenced under technical topics (quality, quantity and governance) as well as action themes (infrastructure, monitoring and enforcement and awareness/participation). Under the Quality technical topic and the infrastructure action theme "complete and operate Zahle WWTP" is an activity that tackles urban sewage. The project is in coordination with the Ministry of Environment and the borrower is the Ministry of Finance in Lebanon.	Has not started yet (pipeline); all project discussions/preparations are still ongoing.	<u>Complementary</u> Operation and maintenance of the Zahle WWTP and other plants across Lebanon, awareness raising and adequate water use and distribution. <u>Non-Duplication</u> Empowering LRA with an enforcement role, completing wastewater networks and building solid waste facilities.

G. Learning and knowledge management

One of the main objectives of the project is to promote KM / learning between Jordan and Lebanon, but also beyond, also with the purpose to replicate and upscale demonstrated adaptation approaches and techniques. This is mostly done through a dedicated project KM / learning component 4.

As component 4 will be mostly executed by UN-ESCWA, learning will be promoted through their Arab Centre for Climate Change Policies (ACCCP) and existing RICCAR Arab Regional Knowledge and information hub on climate data and analysis.

At the regional / international level, learning/knowledge will be managed and promoted through the creation of a community of practice (CoP). The CoP will focus on water-related climate adaptation in urban areas hosting displaced communities with gender mainstreamed in alignment with AF gender policy (with implications of the Syrian crisis) (with documentation of good practices and lessons; replication package; project baseline and results video; etc.). The ACCCP is established pursuant to resolution 329 adopted at the 30th ESCWA Ministerial Session (Beirut, 28June 2018) with the aim to strengthen the capacity of Arab States to better understand and address the implications of climate change for sustainable development in the Arab region.

The Virtual CoP will be established as one of the regional nodes of RICCAR targeting cities to serve as a working group of policy-makers, practitioners and researchers to increase the understanding and knowledge sharing about mainstreaming of gender-sensitive climate adaptation mainstreaming within municipal planning, taking into consideration displacement aspects. The CoP will contribute to the design, test and evaluating the impact of "the urban risks and vulnerabilities assessment, planning and management approach model for type 2 cities" resulting from this project. It will also enhance the networking, communication and coordination between urban climate action practitioners, policymakers, researchers, funders, and the communities-at-risk. Membership of the CoP will be open for all city officials (mainly 3RP countries but other cities with similar contexts in the Arab region could join), key global and regional stakeholders responsible for planning, and implementing climate change adaptation related issues. The CoP will be an open-access knowledge platform displaying developed resources and technical tools. It will include a free membership-based space for dialogue and interaction among members of the CoP. The CoP will also connect with other relevant platforms and databases relevant to urban climate action as well as the Planners for Climate Action and the 3RP platform. The core partners of the CoP will be the members of the regional SC of the project. The regional SC will act as secretariat of the CoP, feeding it with technical inputs, driving its activities and priority themes. The CoP, being part of a regional knowledge hub, could also host technical materials and capacity development opportunities shared by members of the CoP for further enhancement of knowledge about climate change adaptation mainstreaming in municipal planning and to promote a dialogue with other cities in the region regarding these important issues.

Sharing of lessons will also be done through regional / international seminars organised by UN-ESCWA (e.g. Arab water weeks, Arab Ministerial Water Councils, Regional Preparatory Meeting on Climate Change) and international events (e.g. (AMFHUD, WUF, COP side events (2x); AFSD; HLPF 2022 reviewing SDG 11 and 6 and HLPF 2023). Proceedings and contribution of the project to these events will be documented and displayed on the CoP platform.

At the national level (in and between Jordan and Lebanon), learning / knowledge will also be managed and promoted through UN-ESCWA. This will be done through regional SC meetings (where possible organised at the same time as UN-ESCWA organised regional / international seminars) and a platform/working space for communication and sharing lessons regarding the project (research; project best practices and lessons learned). Field visits to project sites will also be organised.

At the district / municipal level, learning / knowledge will be managed and promoted by a consultancy firm. UN-habitat in coordination with universities and execution entities. Geo-referenced databases and an online platform will be used to share project data produced + territorial observatories (by universities) in the target areas. The consutancy firm will also develop the 'regional' urban risks and vulnerabilities assessment, planning and management approach model for type 2 cities.

At the community level, project beneficiaries will be involved through a participatory assessment, planning approach (comp 1) and capacity and skills building (comp 2) to operate, maintain and replicate the

proposed concrete adaptation techniques being developed under comp 3. Moreover, capacities of government officials, mostly at the municipal level, but also at the national level, will be strengthened to operate, maintain techniques and replicate these, as well as approaches.

Knowledge sharing tools to be used include websites, including existing platforms, social media streams (e.g. Facebook), outreach and information sessions, presentations and a project video, but also produced strategies, plans and guidelines.

Lessons learned, especially what worked and what did not, will be captured through monitoring of all project sub-interventions, also to identify what worked and what not. This would then feed into replication / upscaling guidelines, which will be developed for all sub-interventions (under component 2). All info will feed into output 4.3. the development of a Regional' urban risks and vulnerabilities assessment, planning and management approach model for type 2 cities. Field visits will also show what worked and what will not.

More details are provided below regarding the specific planned activities under each expected output of this component, thus strengthening the rationale of this regional outcome of the proposal.

For output 5.1, "Regional / international KM with focus on sharing project lessons and replication of good practices"

- Establishment of the regional and national steering committees and development of their terms of reference to ensure transfer of knowledge and documentation of good practices as well as drive the CoP activities.
- Development of specific publications/video/leaflets on lessons learned and best practices implemented in the target cities of the project that will inform other cities in Syria-neighbouring countries part of the 3RP, to be disseminated both through the CoPand 3RP platforms and presented in regional/international events. Documenting good practices and lessons learned from the onset of the project implementation and making them available in Arabic and English through the CoP that will be accessible to the stakeholders is vital given the lack of good cases of cities mainstreaming climate change in urban planning in this region. This will also enhance sustainability as it will encourage continuity of the good practices identified even beyond the project implementation period.
- Based on the deliverables under Component 1 and 2, (tools, guidelines, plans/strategies), common/harmonised guidelines on gender-sensitive climate adaptation mainstreaming in urban planning for the Arab region encountering massive displacement that can be applied by other countries and positively influence their own strategies, plans and legislation.
- Organize four regional workshops back-to-back with the regional SC meetings to disseminate these guidelines to the relevant Arab city officials and share experience. Outcomes of these workshops will be published on the CoP and other relevant platforms. The regional workshops will focus on water-related climate adaption with gender mainstreamed and identifying best practices implemented at the city level. National and local government representatives from other 3RP countries will be invited, as well as regional and global actors from academia, civil society and bi/multi-lateral donors, with the idea to promote urban climate adaptation in the region and identify opportunities for resource mobilisation and scaling-up.

For output 5.2, "Jordan and Lebanon KM with focus on project progress, best practices and lessons learned"

- Organize City-to-City exchange in and between Jordan and Lebanon to share lessons learned of the implementation of the project components 1, 2 and 3. and facilitate peer-to-peer learning and cross-fertilisation among city officials but also vulnerable groups of women, youth and displaced to share and disseminate information about their newly developed skills and innovative climate adaptation measures implemented in the project.
- Undertake and exchange exploratory field visits for city officials of the project sites in the target cities of both countries of the project to learn from good practices implemented there and engage them in city dialogues on climate change adaptation in urban settings.

For output 5.3, "Sub-national KM and Regional' urban risks and vulnerabilities assessment, planning and management approach model for type 2 cities"

- A Sub-national KM and Regional' urban risks and vulnerabilities assessment, planning and management approach model for type 2 cities will be defined with key monitoring indicators to better

assess the efficiency and effectiveness of the proposed approach taking into account climate change related urban water scarcity challenges. The model will be discussed by the CoP, presented in online webinars for further refinement and endorsement.

- Develop online modules to translate the model into actionable steps easy to understand and implement by City officials with similar context. The modules will be made available on the online knowledge platform for further dissemination beyond the project timeframe.

- Participation of project partners in relevant international and regional events related to climate change adaptation, and displacement, as needed for promoting and disseminating the model, and for learning from other similar projects and approaches on-going in other Arab countries or in other regions.

For output 5.4, "Incentive mechanism (financial) and regulatory framework to replicate and upscale rainwater harvesting activities"

- Development of incentive mechanism (financial) and regulatory framework to replicate and upscale rainwater harvesting activities and publish and share it with other relevant cities in Jordan through the city-to-city exchanges for further replication.

Table 15: Learning and knowledge management

Expected Concrete Outputs	Learning objectives (lo) & indicators (i)	Outputs / knowledge products
Outputs 1.1. Territorial planning and development strategy / guidelines with CC and gender mainstreamed in Lebanon 1.2. Urban master plans at municipal level with CC and gender mainstreamed in Lebanon 1.3. Urban master plans at municipal level with CC and gender mainstreamed in Jordan	(lo): To use strategies and plans to better plan municipal assets, esp water (taking into consideration both climate change and DPs migration (i): Number of plans; number of trainings	- Territorial planning and development strategy / guidelines, incl. toolkit on mainstreaming climate change and DPs considerations in land use planning to address water issues in type 2 cities - Urban master plans and investment plans (+ feasibility assessments) - Target areas climate change vulnerability profiles - Training reports
Output 2.1. Community organisation, awareness and capacity / skill building + operation, maintenance and replication and upscaling plans for concrete adaptation output 3.1 2.2. See above for output 3.2. 2.3. See above for output 3.3. 2.4. See above for output 3.4. 2.5. See above for output 3.5. 2.6. See above for output 3.6. 2.7. See above for output 3.7. 2.8. See above for output 3.8 2.9. See above for output 3.9	(lo): Build community and vulnerable groups capacities and skills to operate, maintain and replicate / upscale resilient water systems; identify best way to reduce (potential) tension between groups (i): Number of plans; number of trainings	- Operation, maintenance and replication plans for all sub-projects, including highlighting what worked and what did not - Training toolkits for building capacities at the community level - Training reports
Output 3.1. Rooftop rainwater harvesting in Lebanon 3.2. Rooftop rainwater harvesting in Jordan 3.3. Greywater treatment and reuse in Jordan 3.4. Efficient treatment and reuse of wastewater in Lebanon 3.5. Efficient treatment and reuse of wastewater in Jordan ~~3.6. Water-use-efficient irrigation of treated wastewater in Lebanon~~ 3.7. Water-use Efficient irrigation of treated wastewater in Jordan 3.8. Permaculture demonstration - closed loop water system in Jordan 3.9. Permaculture demonstration - closed loop water system in Lebanon	(lo): showcase best practice information on replicable innovative techniques / interventions in context of high influx of DPs and climate change impacts (i): Number of techniques / interventions showcased	- Techniques / interventions documented, including what worked and what did not highlighted. This will feed into the replication / upscaling guidelines (component 2) and Regional' urban risks and vulnerabilities assessment, planning and management approach model for type 2 cities (component 4)

Output 4.1. Regional / international KM with focus on sharing project lessons and replication 4.2. Jordan and Lebanon KM with focus on project progress, best practices and lessons learned 4.3. Sub-national KM and Regional' urban risks and vulnerabilities assessment, planning and management approach model for type 2 cities 4.4. Incentive mechanism (financial) and regulatory framework to replicate and upscale rainwater harvesting activities	(Io): Share lessons on how to address climate change impacts in type 2 cities context (i): Number of knowledge products and events in which lessons will be shared (i): % increased knowledge of stakeholders of the CoP on water-related climate adaptation with gender mainstreamed cities hosting refugees	- Community of practice on climate change in urban areas - Presentations and knowledge sharing materials at international conferences - KM platforms - Project video - Field visits - Online modules - Regional' urban risks and vulnerabilities assessment, planning and management approach model for type 2 cities - Documented proposed incentive mechanism (financial) and regulatory framework to replicate and upscale rainwater harvesting activities

H. Consultative process

For the project preparation phase, consultations have been conducted with key stakeholders and beneficiary communities, including representatives from the government, UN agencies, NGO's and vulnerable groups. An overview of consultations conducted, including objective, outcomes and how inputs have been incorporated in the proposal is available in annex 3. Details such as completed consultation questionnaires and attendance sheets are available on request. Four type of consultations shaped this proposal. Consultations to:

- Align with National and sub-national priorities: throughout the project preparation phase, UN-Habitat worked with the AF focal points, ministries mandated to work on aspect touched by the project (i.e. water, agriculture, spatial planning, etc.) and target municipalities. The proposed project activities have been prioritised / selected with these government representatives, as well as the target areas. Both Jordan and Lebanon governments prioritised water harvesting and wastewater treatment and reuse adaptation measures (see annex 3)
- To avoid duplication with other projects (government, UN agencies, NGOs, etc.) and use lessons learned (see annex 3)
- Identify specific needs and possible concerns of vulnerable groups. In line with AF ESP and GP policies, consultations with beneficiary communities and specific groups (especially women, youth, Syrians) of each sub-project took place to identify specific needs and possible concerns regarding the proposed project activities (see annex 3, 4 and 5).
- Identify potential environmental and social risks and impacts. Related to above and in line with AF ESP and GP policies, consultations took place to identify potential risks and impacts of proposed project activities. This also includes public hearings in line with national requirements for conducting EIA ((see annex 3, 4 and 5).

Table 16: List of stakeholders consulted. For more details, including outcomes, see annex 3

Stakeholder	Leb	Jor	Principle choice for consultation						Method
			To align with government priorities	To avoid duplication with other projects	To comply with standards, rules and regulations	Identify specific needs and possible concerns vulnerable groups	Identify potential environmental and social risks and impacts.	Discussing Lebanon's ongoing financial crisis and the challenges that governmental institutions are facing	
Ministry of Environment	x	x	x	x	x		x	x	Private meeting Steering committee
Ministry of Energy and Water	x		x	x	x				Private meeting Steering committee

Council for Development and Reconstruction	x		x	x					Private meeting Steering committee
Bekaa Water Establishment	x		x	x	x			x	Private meeting Steering committee
Litani River Authority	x		x	x	x				Private meeting Steering committee Execution partner
Lebanese Agriculture Research Institute	x		x	x		x		x	Private meeting Steering committee
Municipality of Zahle	x		x	x	x	x			Private meeting Steering committee
Municipality of Bar Elias	x		x	x	x	x			Private meeting Steering committee
Other target Municipalities	x	x	x	x					Private meeting
Ministry of Planning and International Cooperation		x	x	x					Private meeting Steering committee
Ministry of water andIrrigation		x	x	x	x				Private meeting Steering committee
Ministry of Local Administration		x	x	x					Private meeting Steering committee
The Ministry of Awqaf Islamic Affairs and Holy Places		x	x	x	x				Private meeting Steering committee
Ministry of Education		x	x	x	x				Private meeting Steering committee
WAJ / Yarmouk Water Company		x	x	x	x				Private meeting Steering committee
Municipality of Irbid		x	x	x	x	x			Private meeting Steering committee
Municipality of Mafraq		x	x	x	x	x			Private meeting Steering committee
UploaD	x			x		x			Calls Execution partner
UN-ESCWA	x		x	x		x			Private meeting Execution partner
UNICEF	x	x		x		x	x	x	Private meeting Execution partner
Johud		x				x	x		Private meeting Execution partner
Badia Fund		x				x	x		Private meeting Execution partner
Permaculture Research Institute		x		x		x	x		Private meeting Execution partner
UN Women	x	x		x		x	x		Private meeting
UNHCR	x	x		x		x	x		Private meeting
UNDP	x	x		x					Private meeting
FAO		x		x					Private meeting
ILO	x	x		x		x	x		Private meeting
OHCHR	x			x		x	x		Private meeting

IUCN	x	x		x		x	x		Private meeting
GIZ	x			x					Private meeting
Norwegian Refugee Council	x						x		Private meeting Community consultations
Solidarites International	x						x		Private meeting
WB	x								Private meeting
Vulnerable groups, including women, youth, Syrians and farmers	x	x				x	x		Focus groups consultations Public hearings

During the pre-concept note development phase, consultations were conducted with the AF focal points and relevant ministries in both countries to ensure project alignment with national priorities (i.e. national strategies and plans). Since then, UN-Habitat staff in both countries continued close coordination with government representatives at the national and municipal level, also through formed steering committees.

During the concept note development phase, consultation were conducted with project beneficiary groups, including vulnerable groups, including through (12) 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, their specific needs and their potential concerns regarding proposed project activities. Vulnerable groups consulted include: Syrian DPs, women, youth, children and disabled people by ensuring their representation in most of the discussions. Whenever possible and acceptable, focus groups with women only followed the main discussions. Some of the community consultations were organised in collaboration with municipalities of Mafraq, Irbid and Zahle and others were organised with support of NGOs and CBOs (i.e. World Vision, Norwegian Refugee Council) working in the target areas.

Workshops with government representatives, academia, etc. were also conducted to identify the main climate change issues, needs and other projects (to avoid duplication) in target municipalities and to further select project activities. Also, “one to one” meetings targeting relevant government institutions, UN agencies, other international organisations and NGOs were conducted.

The outcomes of consultations shaped the selection of proposed interventions at that stage. Some of the proposed interventions were excluded due to cost inefficient (in low density areas), non-feasibility due to e.g environmental risks (e.g groundwater use) and non-preference of beneficiary groups. In some discussions, new interventions were suggested by the communities (e.g. efficient irrigation techniques). Also, measures will be taken to respond to some concerns raised, especially those of Syrian DPs and women

During the full proposal development phase, accredited consultants to conduct feasibility assessments and environmental and social risks screening and impact assessment were hired in both countries. These consultants followed national requirements to do these assessments (including public hearings), as well as AF requirements (consultations with all beneficiary groups to identify potential risks and impacts, including possible concerns). Complete national feasibility assessment, ESIA-ESMP and consultation reports are available on request. In April 2020, additional consultations have been conducted to identify specific needs and possible concerns and risks regarded to permaculture intervention in Lebanon. This has been done following Covid-19 restrictions for meeting. Meetings were in person but on distance, with various representatives of vulnerable groups and especially farmers. Consultations targeting farmers were completed on field in two areas, at LARI premises and at the Municipality of Zahle. Throughout implementation, beneficiary communities and groups will participate in the works carried through demonstration plots at LARI and on their own plots of farmland. Consultations were done in the form of an online survey through Microsoft Forms (results can be accessed through the following link).

Figure 11: Consultation carried out at LARI premises

Figure 12: Consultation carried out at Zahle Municipality

Figure 13: Lebanon workshop to identify main climate change issues, needs and other projects in target municipalities and to further select project activities. Attendance sheets can be shared on request.

Figure 14: Jordan workshop to identify main climate change issues, needs and other projects in target municipalities and to further select project activities. Attendance sheets can be shared on request.

Figure 15: Example of community consultations and women focus groups and representatives in Lebanon

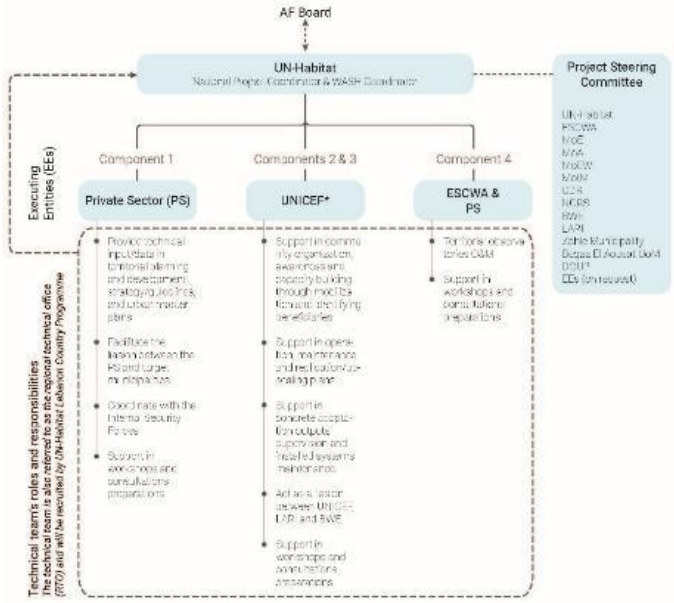
Figure 16: Example of community consultations and women focus groups and representatives in Jordan

Inception Phase Consultation and Original Proposal Changes

After the approval of the original proposal and launching of the project, latest political and financial crisis developments in Lebanon brought changes to the project documents. Negotiations with BWE and LARI were held when UN-Habitat Lebanon Country Programme invited the partners to attend the AF Inception Workshop and join the Project Steering Committee. Several bilateral consultations (with Mr. Rizk Rizk – President, General Director and Chairman of the Board of the BWE – and his assistant Ms. Carla Beshwaty in October 2021 and Dr. Ihab Jomaa – Head of the Department of Irrigation and Agrometeorology at LARI – in September 2021) were held to discuss Lebanon's ongoing financial crisis and the challenges that governmental institutions are facing. Follow up meetings with both parties also took place in December 2021 and early 2022. Both partners expressed their inability to receive funding (as per the justification letter submitted to AF in February 2022) and suggested that UNICEF should acquire their activities – due to the organization's proven track record in handling similar projects in the target area and positive impact. Similarly, consecutive meetings were organized with UNICEF's representatives in Lebanon in October and December 2021 as well as February 2022 to ensure their interest and capacity in undertaking BWE's and LARI's activities and receiving their allocated funds. No further objections were presented from the involved entities regarding this change. UN-Habitat validated all the bilateral conversations with the NDA.

Additionally, during the consultations with BWE, LARI, UNICEF and the NDA, all parties agreed that the technical team (also referred to as the regional technical office [RTO]) will be responsible to follow up on all 4 components and report the progress of the works to UN-Habitat Lebanon Country Programme. The team's involvement will also include technical backstopping to some of the activities under components 1, 3 and 4. The hired staff will be located at LARI premises. See the below flowchart for additional information relating to the level of support provided under each component.

As agreed with the NDA, UNICEF and involved partners, LARI will still provide technical backstopping to Outputs 2.1, 2.6, 2.9 and 3.9. LARI are also a member of the Steering Committee under this project.



Roles, responsibilities and reporting lines flowchart

Assessment Phase Consultations

At the startup of the assessment phase (Phase I) of the project components, a number of consultations were implemented in Lebanon and Jordan during the period June-July 2022 as outlined below.

Lebanon

A number of consultations have been implemented in Lebanon during the assessment phase (Phase I) of components 2.1, 2.4 and 2.6. The consultations were implemented with the Ministry of Environment, local authorities and farmers from the study area and encompassed the following concerns and recommendations which were incorporated when feasible in the current updated project document:

- The Ministry of Environment assisted in the screening of the new project amendment under output 3.4 and indicated that there is a need to develop an Environmental Impact Assessment (EIA) study for this component due to the large irrigation area exceeding 500 hectares and thus requiring an EIA study based on National Decree 8633.
- The Municipality of Zahle requested a change in the concept design of the treated wastewater conveying system in order to 1- allow for the storage of treated wastewater prior to distribution and 2- increase the surface area irrigated with wastewater. This would solve the problem of unavailability of water during dry season and lack of storage equally voiced by the farmers. The new concept (reflected in the changes to the current updated project document) includes a storage reservoir of 10,000 m^3 and a 9,300 m pumping line conveying the water to two irrigation zones with a total surface area of 800 hectares.
- The Municipality of Marj requested the replacement of two buildings originally proposed to be targeted by rainwater harvesting with other locations which encounter high water demand and water shortage; the latter buildings were checked and found to be unfeasible to target.
- The Union of Municipalities of Central Bekaa stressed the need to select the most vulnerable farmers as project beneficiaries.

Jordan
Jordan

A series of intensive meetings took place with all Executing Entities (EEs) to review their latest proposed changes at the real start of implementation (July 2022) allocated budgets, targets and outputs. During the meetings, the project proposal document was scrutinized and analysed in order to make sure that the EEs can reach their newly proposed targets and outcomes instead of falling short of them. The reason for such a review is due to the change in prices and inflation between the year 2019 and 2022. The meetings took place at the EEs offices and online.

I. Justification of funding request

There is little exploration of how urban systems respond to a rapid influx of new and often long-term residents by conflict combined with climate change impacts. Therefore, it is manifest and critical to build resilient communities and institutions that are equipped to respond to shocks and stresses arising from climate change in combination with displacement. This project explores and collects evidence of approaches and best practice techniques that effectively respond to these challenges faced in urban areas in Jordan and Lebanon.

The project will support implementation of national priorities as well as responding to local needs, especially of the most vulnerable, and will provide added value to national plans and approaches through implementation of innovative technical interventions. The proposed project components also fully align with AF outcome areas. This alignment has resulted in the design of a comprehensive approach to address climate change related water challenges in a type 2 host cities context.

There is a need for concrete adaptation actions in the water sector in the targeted urban areas in Jordan and Lebanon focusing on the most vulnerable groups. Since most Syrians in Lebanon and Jordan work in the water-dependent agriculture sector and have limited access to water, increasing water scarcity, acerbated by climate change, is a big challenge. The actions are crucial for the urban areas to cope with current and future climate change impacts exacerbated by the influx of Syrian DPs. The Third National Communications to the UNFCCC of Jordan and Lebanon stated clearly that financial constraints are among the barriers to adaptation and that there is a clear need for funding and capacity building to support national and municipal climate action. As mentioned earlier, the target urban areas were selected because of a combination of existing and projected climate change-related water challenges, high pressure on water resources due to high influx of DPs and lacking resources and capacities to address these climate change-related water issues and specific needs of DPs, which includes access to affordable water.

From a regional perspective, the project can be justified by responding to some funding gaps under the regional Syrian crisis response programming (i.e. 3RP), where budget gaps exist, especially under the WASH and the social cohesion and livelihoods components,[103] which is most relevant in 'host' cities (see also annex 1). Besides that, considering the significance of the combined challenges posed by the climate change and the Syrian crisis, regional knowledge exchange and learning is needed, between Jordan and Lebanon, but also in the wider region, which will be done through component 4.

The project aims to maximizing the funding amount for the concrete adaptation component (component 3; USD 7,5 million, which is approx. 2/3 of the sum of the four project components); funding allocation to component 2 is required to operate, maintain and replicate the proposed concrete interventions under component 3. Funding for component 1 is needed to more efficiently assess, plan and manage water at the municipal level, including to identify additional solutions to adapt to climate change.

The table below provides a justification for funding requested, focusing on the full cost of adaptation reasoning, by showing the impact of AF funding compared to no funding (baseline) related to expected project outcomes.

Table 17 Overview of impact of AF funding compared to no funding (baseline) related to expected project outcomes

Project outcomes	Baseline (without AF)	Additional (with AF)	Comment and alternative

[103] 3RP Regional Quarterly Dashboards March 2018. Online: https://data2.unhcr.org/fr/documents/download/63820

			adaptation scenario's
1.Strengthened municipal institutional capacity to manage climate change and DP crisis related urban water scarcity challenges by mainstreaming these aspects into spatial strategies + developing action / investment plans and guidelines (with identified solutions) to use water most efficiently within municipal boundaries (in line with AF outcome 1 and 2)	In Jordan and Lebanon, water is managed at the national and district scale, by looking also most solely at current demand and supply needs, with limited consideration of climate change and population movement trends. Most of the response in target areas is still humanitarian; therefore, a sustainable water assessment, planning and management approach is lacking;	The activities related to this outcome will allow municipal governments to assess, plan and manage climate change and DPs movement related risks and vulnerabilities, especially related to (on-conventional) water, in a participatory, integrated, sustainable and climate change resilient way; and inform national decision-making more efficiently Displacement and climate change are increasingly important factor driving urban growth trends. Taking into account the scale, scope and impacts of displacement and climate change in the target areas, strategies and master plans will help municipal government to respond to the challenge effectively	Although municipalities have the mandate to develop these plans, they lack the capacity and financial resources to execute activities related to this outcome without support Without sustainable and climate change resilient approaches, target areas will become more water scarce, resulting in negative effects for poverty reduction targets and livelihood security and possible tension over scare resources. Alternatively, water is managed through IWRM approaches, but this is not in line with national priorities / practices
2.Strengthened DPs and host communities awareness and ownership of CC adaptation measures + capacities strengthened to operate, maintain and replicate proposed adaptation measures, including skills building (in line with AF outcome 3 and 8)	Target communities have very limited options (capacity – skills and technically - and financial resources) to protect their people and assets against climate change impacts, especially lack of water. Rising social tensions between host communities and DPs, pose risks and threats to development gains	The activities related to this outcome (combined with outcome 1) will enable communities and vulnerable groups to operate and sustain systems and to assess, plan and manage these together. It will also increase livelihood / income security; Inclusive approaches that promote social cohesion need to be an integral part of displacement responses, especially around scare resources	Communities and vulnerable groups lack the capacities to operate and sustain systems and to assess, plan and manage these together. Without sustainable and climate change resilient water management approaches at community level, target areas will become more water scarce, resulting in negative effects for poverty reduction targets and livelihood security and possible tension over scare resources. Alternatively, livelihoods could be diversified more, but as water is an urgent issue, this has been prioritized.
3.Increased adaptive capacity within the water sector through resilient and sustainable water harvesting, supply and irrigation options, using innovative and replicable techniques suitable for the context and benefitting vulnerable groups (in line with AF outcome 4 and 6 and 8)	Municipal governments invest very little in sustainable and climate change resilient urban water services, considering most cities in Jordan and Lebanon are already suffering from inadequate service provision and overextraction and pollution of groundwater. Displacement and climate change exacerbate the situation by adding extra pressure on services, often becoming a source of tension with discontent and competition around services.	The activities related to this outcome will increase the sustainability and climate change resilience of water-related services and livelihoods dependent on water in and around the target municipalities. Taking into consideration the DP and climate change context, techniques selected can be replicated in similar context areas.	Top-down proposed interventions have the risk of not being community driven and appropriate and will also not respond to the situation. The interventions selected respond to larger water system challenges, especially overextraction of groundwater and water pollution, which pose health risks and livelihood security challenges. Alternative adaptation scenarios are ad hoc humanitarian responses, which would respond to urgent needs, but not in a sustainable and climate change resilient way.

4.Strengthened (inter)National institutional capacity to manage climate change and DP crisis related urban water scarcity challenges, including lessons learned collected and shared regionally (in line with AF outcome 3 and 8)	National governments in the Mashriq region have limited capacity and knowledge about available models, tools, techniques + limited financial resources to respond to the combined challenges of climate change and displacement , especially in urban areas.	The activities related to this outcome will allow governments in the region, including at the municipal level, to replicate the approach / model and best practice adaptation interventions to respond to a combination of high DP influx (i.e. type 2 cities) and climate change challenges	Without activities related to this outcome, there is a risk that interventions won't be replicated and sustained and demand for adopting similar approaches is not generated; and high-level and international support and engagement for the proposed approach is not mobilized.

J. Sustainability

The adaptation benefits to be achieved through the project will be sustained after its end, and replication and scaling-up options promoted through other (potential) funds after its end, especially through component 4. Sustainability and maintenance arrangements for concrete adaptation interventions (comp 3) are layed-out in table 18 below, as well as those for strategies and plans developed under comp 1 and capacities build under comp 1 and 2. Knowledge produced will be shared through comp 4.

At the regional level, project learning and replication and upscaling of outcomes will be promoted through comp 4, which includes knowledge and learning exchange between Jordan and Lebanon and the larger region. At the national level, the project will be sustained through the strong linkages of the proposed project activities with national and sub-national priorities (ensuring national buy-in). At the local level, the full engagement of communities and vulnerable groups in project activities, including assessments, planning and decision-making processes, should achieve building of communities' awareness and capacities and furthermore ownership and leadership in the area of water management – see component 1 and 2. Specific emphasis is given to community capacity strengthening to operate, maintain and replicate the systems (including the development of operation, maintenance and replication plans). Also, through the participatory approach, the project activities aim to contribute to avoid potential future tension over scare resources. With all four components, the project aims to support sustainable development in target areas in Jordan and Lebanon and the wider region, compared to a currently humanitarian / emergency driven approach.

Institutional sustainability: the project paves the way for the Jordan and Lebanon national and municipal governments, but also other governments in the region, to replicate and up-scale the project through the development of best practices assessment, planning and management approaches (comp 1) and best practices concrete adaptation measures, that will be shared regionally under comp 4. Trainings of government staff, especially at the municipal level, will be conducted to strengthen relevant government capacities to deliver and sustain project activities. This would include conducting climate change vulnerability assessments, resulting in target area climate change vulnerability profiles with specific data that should be collected when iterations of municipal plans take place (which is mandatory by law). Part of the detailed project activities under this component (see Part II.A) is the support of a monitoring system with required indicators. Besides that, UNESCWA and Riccar are developing localised climate change scenarios and vulnerability profiles, which would be matched with data from the ground in the target areas. Based on the assessments conducted, responses to the most critical climate change hazards, especially droughts and floods (and other issues identified) can be formulated and prioritised. Through the master plan, responses can be shown spatially. This means e.g. avoiding development in high risk areas or planning concrete interventions to reduce specific identified risks and vulnerabilities.

Sustainability urban observatories:

In both Jordan and Lebanon, urban observatory staff will be supported to continue after the project through allocated municipal yearly budgets. This allocation will be part of an agreement between UN-Habitat and the municipalities. In Jordan, urban observatory focal points are already appointed in municipalities. In Lebanon, this will be done as well. In both Jordan and Lebanon, UN-Habitat will sign an agreement with the target municipalities for establishing and managing and sustaining the urban observatories. This will include an exit strategy with allocated budgets for continuation of staff. This model builds on previous experiences in sustaining urban observatories in Lebanon.

In Jordan, the cities and villages development Bank (CVDB) started a national programme to establish municipal observatories in all municipalities in Jordan, based on a prime ministry decision. They assigned a national focal point to collect data from all municipalities and they developed a draft data collection template. According to the latest re-structuring process of CVDB, a municipal observatories unit was established under the Technical Affairs Directorate[104] at the CVDB. The unit has a statistician, IT programmer, Administrative data specialist and data entry. It will be responsible for the overall project and its sustainability.

This initiative comes in line with the CVDB strategic plan 2017-2021 and Jordan 2025 as well as the draft Local Administration Law, a new piece of legislation, which is currently being drafted by the government and sent to Parliament for debate, that will replace the decentralization law and municipalities law. It governs and organizes the work of the governorate and the city at local level and defines the responsibilities of local authorities. The idea is to empower local authorities and ensure that all the services are secured in each governorate by the local governorates.

In Lebanon, UN-Habitat signed an agreement with a municipality Union of Municipalities (Southern Lebanon for the Unions of Municipalities (UoMs) of Tyre, Marjeoun and Bint Jbeil Cazas) to establish and manage and sustain an urban observatories before, including an exit strategy with allocated budgets for continuation of staff. The agreement included the following local commitments.

- Incorporate LUO operating cost within the Union of municipalities yearly budget.
- Incorporate LUO staff within the Union of municipalities administrative structure.
- Produce knowledge management and policy guiding tools.
- Establish horizontal linkages with different entities and institutions as making the data available for the different users and participants
- Ensure that information is used to strengthen decision-making and policy formulation

Social sustainability: by organizing and fully engaging community members and vulnerable groups in project activities, including assessments and planning processes during project preparation and implementation, the project aims to achieve long-lasting awareness and capacities of community members.

Economic sustainability: investing in increasing the resilience of vulnerable assets is a sustainable economic approach. It will avoid future costs related to drought / water scarcity and flood impacts, especially on the vulnerable agriculture sector.

Environmental Sustainability: the proposed project interventions support environmental sustainability by reducing the use overextracted groundwater resources and reduce pollution of water, including of streams and irrigation channels.

Financial sustainability: the proposed interventions are fully aligned with national and sub-national priorities and programmes and therefore, the government actively supports the project and interventions, including anchoring it to existing programmes and monitoring frameworks.

Technical sustainability: techniques used are innovative in the target areas but through operation and maintenance plans and the need to adopt such techniques, also identified in national priorities, sustainability will ensured.

Maintenance arrangements for the wastewater treatment plants

Jordan:

The Government of Jordan (GoJ) is the only entity in Jordan authorized by law to manage and deliver water and wastewater services in the country either through the central Ministry of Water and Irrigation (MoWI)/Water Authority of Jordan (WAJ) or through its daughter companies in charge of such services in certain governorates. Yarmouk Water Company (YWC) is a national limited liability company wholly owned by MoWI/WAJ, which was established on 26/7/2010 for the management of water and wastewater in the four governorates of North Sector of Jordan (including the three governorates of Irbid, Mafraq, and Jerash where the three WWTP facilities of this project are located) in accordance with the provisions of the

[104] http://www.cvdb.gov.jo/images/orginzation-chart2019.pdf

Field Code Changed

Jordanian Companies Law No (22) of 1997. YWC is managed and supervised by a board of directors consisting of (7) members, which is responsible to the General Assembly.

Realizing the big need to utilize treated wastewater for irrigation to ease the stress on freshwater resources in the country (only 265 cubic meter per year (about 56 cubic meters per year per capita considering the average size of the Jordanian family is 4.7 according to Department of Statistics-DOS), the Government of Jordan allocates constant share of financial resources for water and wastewater services in the state's annual budget, where the latter is enacted by a law annually voted on by the Parliament, which sets allocation for the year on hand and forecasts estimate budgets for the following two years to come. YWC, through MoWI/WAJ, receives its annual allocation of the budget, which include named sub-allocation for operation and maintenance of all Wastewater Treatment Plants (WWTPs) under its mandate including the three WWTPs of this project where certain amount of the allocation is particularly set to maintain the quality of treated water to meet the incumbent standard.

For example, the 2020 State Budget of Jordan, which was approved in January 2020, allocated for MoWI/WAJ under Section 8102 (attached in Arabic) a total of 364,168,000 JOD (= 513,642,576 United States Dollars) for 2020 and forecasted approximated budgets for the years 2021 and 2022. The allocation for sewage management and all other related activities for YWC for the Northern Governorates is for 2020 set under Program number 8006 with a total of 8,650,000 JOD (= 12,200,435 USD). The breakdown for each specific WWTP of the three WWTPs of this project is provided on page 5. Such allocations cover all aspects of running constant O&M costs as well as new activities (expansion, ad-hoc, emergency burdens, etc).
Thus, the GoJ is committed to finance permanently the O&M and sustainability of the water and wastewater services in the country through an institutionalized state budget. However, when water and wastewater authorities in Jordan receive financial aid from donors or grants, such as the AF's grant, that support is utilized to institutionalize the process of serving the objectives of that aid and augmenting the tailored end products (adaptation measures in this case) sought from the intervention of that extra support while maintaining covering the costs of business as usual operations from the state budget. Such newly institutionalize measures become then part of the business as usual operations. As per the details of the proposed wastewater treatment-related activities under this project, as can be seen in the detailed budget, maintenance requirements have also been considered in terms of providing required equipment for this.

Lebanon
The Ministry of Energy and Water in Lebanon (MoEW)) is the only entity in Lebanon authorized by law to manage and deliver water and wastewater services in the country either through the four regional Water Establishments and/or the Litani River Authorities as per Law 221/2000 and all its related amendments.

Since water is not properly metered across Lebanon, customers connected to the water network do not pay based on the amount of water they use. A lump sum is paid on a yearly basis for a municipal water supply of 1 m^3/d and has increased from 300,000 to 970,000 LBP between the years 2019 and 2022 due to the financial crisis in Lebanon (i.e. from around $198 to around $640 as per the official exchange rate of 1515 LBP for each $1). However, due to intermittent supply, this quantity is not actually supplied. Since public buildings have a high demand of water, their subscription would be more than 1 m^3/d. Moreover, a small fee was added to the yearly fee paid by residents for wastewater connection to the
Moreover, a small fee was added to the yearly fee paid by residents for wastewater connection to the network. Water Establishments rely on the applied yearly tariffs to operate and maintain water/wastewater infrastructure. As for the water sourced from external suppliers during dry periods, the approximate cost of water has similarly increased from 250,000 to 1,500,000 LBP between the years 2019 and 2022 (i.e. from around $165 to around $990) for 20 m^3 of water, which evidently constitutes a growing financial burden on vulnerable populations. The proposed project helps in this respect through mitigating excessive groundwater withdrawals which otherwise exacerbate water shortages.

In the context of the proposed treated wastewater reuse project, the cost of system maintenance during the lifetime of the project has been accounted for in budget allocations. Also, a socio-economic study is planned to be subcontracted to the private sector to assess the willingness to pay of the farmers for their entitlement to use the treated wastewater which will be made available through the project. This will help determine the tariff that can be charged for the provision of treated wastewater for irrigation, which evidently would be used to sustain project operation and maintenance in the future together with the above

described government yearly tariffs. A strong commitment of the local Municipality to take charge of treated wastewater tariff collection and use for system operation and maintenance in the future was expressed during the recently implemented public consultation meetings.

Today in Central Bekaa, the operated Zahle WWTP currently discharges the treated effluent—which was deemed to be useful for irrigation—in the Litani river without making any agricultural or financial benefit. Hence, the CCAF proposal for Lebanon aligns with the *Water Sector Crisis Response Plan* (sustainable approach/plan to treatment plants) currently being developed by the MoEW which stresses on administering proper tariffs, increasing the number of subscribers (which goes hand in hand with awareness raising campaigns and close community consultations) and training the Water Establishments' skilled staff to properly operate and maintain treatment plants across the country.

All proposed interventions of the permaculture project do ensure sustainability either through personal initiatives or through external funding resources. For instance, at the farmers' level the approach suggested/to be adopted is designed in a way to self-sustain itself. Water harvested for irrigation, reuse of agricultural waste (pruning twigs from vines and fruit trees, among other farm wastes …), techniques for self-made biofertilizer production, among all the other suggested approaches in the adaptation measure's description. Also, and as part of the proposal, training sessions will be conducted with all beneficiaries which would include information on proper evaluation, monitoring and maintenance. As for the educational facility, UNICEF will establish a coordination mechanism between LARI / Ministry of Agriculture, Ministry of Education and Higher Education and the Lebanese University to ensure its long-term sustainability. As per the details of the proposed wastewater treatment-related activities under this project, as can be seen in the detailed budget, maintenance requirements have also been considered in terms of providing required equipment for this.

Table 18: Project activities' sustainability and maintenance arrangements, including replication and upscaling

Detailed outputs / activities	Maintenance measures	Responsible	Replication + Upscaling measures	Responsible
Component 1: Increasing the resilience of municipal governments: Manage urban risks and vulnerabilities in the context of climate change, esp. water scarcity challenges, and urban (population) growth, incl. from DPs migration				
Territorial planning and development strategy / guidelines at district level with climate change and gender mainstreamed (Lebanon)	Below municipal staff will be involved and trained, as well as appointed staff form higher level planning authorities to develop the strategies and guidelines for replication and to embed these in national government processes, including monitoring framework and indicators to be used	Planning: Un-H with a consultancy firm Implementation/after project: target district; Ministry of Interior and Municipalities (MoIM), Ministry of Public Works (MoPW), Ministry of Energy and Water (MoEW), Ministry of Environment (MoE), Ministry of Agriculture (MoA).	Replication at other districts, informing area-based planning to the Directorate General of Urban Planning (under the MoPW)	Line Ministries
Urban master plans at municipal level with climate change and gender mainstreamed (Lebanon)	As municipalities are mandated to develop master plans and to manage water within municipal boundaries, dedicated staff will be appointed and trained to deliver and sustain project activities, including through a monitoring framework and indicators to be used. For the Urban observatories, focal points of the Urban observatory (one regional) will be appointed and annual municipal budgets will be dedicated for O & M	Planning: Un-H with a consultancy firm Implementation/after project: target district; Ministry of Interior and Municipalities, Ministry of Public Works, Ministry of Energy and Water, Ministry of Environment.	Replication at other Municipal levels of the district. Informing Municipal strategic planning to the MoIM	Line Ministries
Urban master plans at municipal level with climate change and gender mainstreamed (Jordan)	As municipalities are mandated to develop master plans and to manage water within municipal boundaries, dedicated staff will be appointed and trained to deliver and sustain project activities, including through a monitoring framework and indicators to be used. For the Urban observatories, focal points for each municipality have already been appointed and annual municipal budgets have been dedicated for O & M	Planning: Un-H with Consultancy Firm Implementation: target municipalities; Ministry of Local Administration;	Replication across all remaining municipalities	Line Ministries
Component 3: Increasing the adaptive capacity of the water sector: Expand unconventional water harvesting, supply and irrigation options, using innovative and replicable techniques suitable for the context				
Rooftop rainwater harvesting in Lebanon	Under comp 2. Output 1 Operation, maintenance and replication plans Awareness raising campaigns and capacity development trainings	During implementation: UNICEF, After project end: Buildings owners and Municipalities	Through the Municipal zoning and building permits	Municipalities
Rooftop rainwater harvesting in Jordan in	Under comp 2. Output 2 Operation, maintenance and replication plans Awareness raising campaigns and capacity development trainings	During implementation: JOHUD After project end: Ministry of Education and Ministry of Awqaf Residential Building owners	Applying similar interventions to other schools,mosques and residential buildings. Initiate a national programme in collaboration with MoLA to enforce the installation of RWH at household level through building licences and permits. Financial incentive mechanism to support the scaling up of the project.	Directorate of Education: Building Department Ministry of Awqaf: Construction and Maintenance Department
Greywater treatment and reuse in buildings in Jordan in	Under comp 2. Output 3 Operation, maintenance and replication plans Awareness raising campaigns and capacity development trainings	During implementation: UNICEF After project end: Ministry of Education and Ministry of Awqaf	Applying similar interventions to other schools and mosques	Directorate of Education: Building Department Ministry of Awqaf: Construction and

				Maintenance Department
Efficient treatment in and reuse from wastewater from Zahle WWTP, Lebanon	Under comp 2. Output 4 Operation, maintenance and replication plans Awareness raising campaigns and capacity development trainings Allocated maintenance budget from regional water establishment (Bekaa Water Establishment) – funded by the World Bank (See Table 14: *Duplication with other funding sources*, under Lebanon National Comprehensive Environmental Management Program) Allocated maintenance budget for the ~~canal~~ reservoir and pumping lines from Zahle municipality and as per the budget line listed in Table 51 (Annex 6: Budget Notes, Output 3.4: Technical support/supervision of the irrigation system installation and maintenance) which allocated $21,120	During implementation: UNICEF, Council for Development and Reconstruction (CDR), The Regional Technical Office (RTO), Litany River Authorities (LRA), Bekaa Water Establishment (BWE) After project end: BWE (mandated to operate and maintain WWTP after being handed over by the Council for Development and Reconstruction CDR) and Zahle Municipality in coordination with LARI, MoA, MoEW and the Bekaa Farmers' Association	Through applying similar interventions to other WWTP across Lebanon	BWE, MoEW
Efficient treatment in and reuse of wastewater from Mafraq WWTP, Jordan	Under comp 2. Output 5 Operation, maintenance and replication plans Awareness raising campaigns and capacity development trainings Allocated maintenance budget from national government and maintenance equipment provided The allocation for sewage management and all other related activities for YWC for the Northern Governorates is for 2020 set under Program number 8006 with a total of 8,650,000 JOD (= 12,200,435 USD).	During implementation: MoWI/YWC After project end: YWC YWC, through MoWI/WAJ, receives its annual allocation of the budget, which include named sub-allocation for operation and maintenance of all Wastewater Treatment Plants (WWTPs) under its mandate including the three WWTPs of this project	Ensure reclaimed water remains of high quality and up to Jordanian Standards: Law No. (22) of 1997	YWC
Efficient treatment in and reuse of wastewater from Maerad WWTP, Jordan	Under comp 2. Output 5 Operation, maintenance and replication plans Awareness raising campaigns and capacity development trainings Allocated maintenance budget from national government andmaintenance equipment provided The allocation for sewage management and all other related activities for YWC for the Northern Governorates is for 2020 set under Program number 8006 with a total of 8,650,000 JOD (= 12,200,435 USD).	During implementation: MoWI/YWC After project end: YWC YWC, through MoWI/WAJ, receives its annual allocation of the budget, which include named sub-allocation for operation and maintenance of all Wastewater Treatment Plants (WWTPs) under its mandate including the three WWTPs of this project	Ensure reclaimed water remains of high quality and up to Jordanian Standards: Law No. (22) of 1997	YWC
Efficient treatment in and reuse of wastewater in Akaidr WWTP, Jordan	Under comp 2. Output 5 Operation, maintenance and replication plans Awareness raising campaigns and capacity development trainings Allocated maintenance budget from national government andmaintenance equipment provided	During implementation: MoWIYWC After project end: YWC YWC, through MoWI/WAJ, receives its annual allocation of the budget, which include named sub-allocation for operation and maintenance of all Wastewater Treatment Plants (WWTPs) under its mandate including the three WWTPs of this project	Ensure reclaimed water remains of high quality and up to Jordanian Standards: Law No. (22) of 1997	YWC

	The allocation for sewage management and all other related activities for YWC for the Northern Governorates is for 2020 set under Program number 8006 with a total of 8,650,000 JOD (= 12,200,435 USD).			
~~Water-use-efficient irrigation of treated wastewater from Zahle WWTP, Lebanon~~	~~Under comp 2. Output 6~~ ~~Operation, maintenance and replication plans~~ ~~Awareness raising campaigns and capacity development trainings~~	~~During implementation: UNICEF, RTO, Zahle Municipality~~ ~~After project end: Farmers and Municipality~~	~~Through irrigation masterplans~~	~~UNICEF, LARI, MoA,Zahle Municipality Farmers Cooperatives~~
Water-use-efficient irrigation of treated wastewater from Mafraq WWTP, Jordan	Under comp 2. Output 7 Operation, maintenance and replication plans Awareness raising campaigns and capacity development trainings	During implementation: BADIA Fund After project end: Farmers	Through irrigation masterplans	Members of the Water Association
Water-use-efficient irrigation of treated wastewater from Maerad WWTP, Jordan	Under comp 2. Output 7 Operation, maintenance and replication plans Awareness raising campaigns and capacity development trainings	During implementation: JOHUD After project end: Farmers	Through irrigation masterplans	Members of the Water Association
Water-use-efficient irrigation of treated wastewater from Akaidr WWTP, Jordan	Under comp 2. Output 7 Operation, maintenance and replication plans Awareness raising campaigns and capacity development trainings	During implementation: JOHUD After project end: Farmers	Through irrigation masterplans	Members of the Water Association
Permaculture demonstration – efficient use of water	Under comp 2. Output 8 Operation, maintenance and replication plans Awareness raising campaigns and capacity development trainings	During implementation: PRI in cooperation with ~~JUST~~Local university/Research Centre After project end: PRI in cooperation with Local University/Research Centre~~JUST~~	Landscape rehabilitation plan(s) by students and PRI team for surrounding areas, including technical replication guidebook (under comp 2); Permaculture site at Local University / Research Centre~~JUST~~ will function as a 2nd PRI regional demonstration site	PRI in cooperation with Local University / Research Centre ~~JUST~~
Permaculture demonstration – efficient use of water in Lebanon	Under comp 2. Output 9 Operation, maintenance and replication plans Awareness raising campaigns and capacity development trainings	During implementation: UNICEF in cooperation with LARI , municipalities, MEHE, farmers, and UN-Habitat After project end: LARI in cooperation with municipalities, MEHE, farmers	Landscape rehabilitation plan(s) by students and LARI in coordination with UNICEF for surrounding areas, including technical replication guidebook (under comp 2); Permaculture sites at LARI will continue to function as a national demonstration site	UNICEF, LARI and municipalities
Component 4: Improving knowledge and policies and regulations to increase urban resilience in the region: Project KM and replication, incl. development of regional urban risks and vulnerabilities management model in the context of climate change and urban (population) growth (incl. from DPs migration)				
Regional / international KM with focus on sharing project lessons and replication	Knowledge will be embedded and shared through the UN-ESCWA Arab center for climate change policies knowledge hub, which is sustained by UN-ESCWA already. The project will feed into refugee response plans in the region	UN-ESCWA + Un-Habitat	This component is 88pecifically designed to share all project lessons (above), also with the purpose to replicate and upscale these. Therse this component can be regarded as part of the replication and upscaling mechanism for the the project activities.	UN-Habitat in cooperation with UN-ESCWAand other key stakeholders
Jordan and Lebanon KM with focus on project progress, best practices and lessons learned	National knowledge sharing will also be sustained through UN-ESCWA	UN-ESCWA + Un-Habitat Ministries of Environment		

Sub-national KM and Regional' urban risks and vulnerabilities assessment, planning and management approach model for type 2 cities	Knowledge will be embedded and shared through the UN-ESCWA Arab center for climate change policies knowledge hub, which is sustained by UN-ESCWA already. The project will feed into refugee response plans in the region	UN-Habitat in cooperation with a consultancy firm and municipalities and universities	This will be done through the UN-ESCWA Arab center for climate change policies knowledge hub, which is sustained by UN-ESCWA already.	
Incentive mechanism (financial) and regulatory framework to replicate and upscale rainwater harvesting activities		UN-Habitat in cooperation with ministries		

K. Environmental and social impacts and risks

The proposed project seeks to fully align with the Adaptation Fund's Environmental and Social Policy (ESP), and its 15 safeguard areas, Gender Policy (GP), Further to Part II.F above on compliance with national technical standards, outlined below is a summary of the findings of the initial screening process to identify and evaluate potential environmental and social risks and impacts of proposed project actions, and based on that, of the entire project. With this information, the entire project has been categorized. As shown in section II.I and annex 3 and 4, consultations have been conducted to identify potential environmental and social risks and impacts and to identify specific groups needs and possible concerns. A draft gender assessment and baseline, containing disaggregated data and approach, containing specific approaches for women and youth, has been developed – see annex 5.

Normative, planning and capacity development activities (i.e. non-concrete interventions) under components 1, 2 and 4 consist of strategies and plans development, capacity development and knowledge exchange. The project will ensure beneficiary groups will be equally represented and equal benefit from the project activities – see annex 4.

Activities under components 3 are 'concrete' adaptation actions. Because of the scope of the proposed actions, which are numerous, small scale and very localized, and will be operated and maintained by water authorities, municipal staff and communities, where possible, who have a stake in avoiding environmental and social risks and impacts, potential direct impacts are limited. Indirect impacts and transboundary impacts are highly unlikely given that water quality improvement activities will only result in improved water quality, not a degradation. Target streams are not transboundary. Given this, cumulative impacts are also unlikely. Because of this, the entire project is regarded as a medium risk (Category B) project. Annex 4 provides an overview of risks screening and impact assessment outcomes conducted in both Lebanon and Jordan. In both countries, risks screening sheets have been completed for each proposed project activity. Besides that, accredited consultants prepared country-specific ESIAs, ESMPs and consultations reports in compliance with the AF ESP and GP and national requirements for conducting ESIAs. The outcomes have been consolidated in the proposal. A scoping report has been prepared, submitted and approved by the Lebanese government.

The country specific ESIAs, ESMPs and consultations reports are available through above website. The completed risks screening sheets for each project activity are available on request. The country-specific ESIA, ESMP and consultation reports are accessible here: https://unhabitat.org/af-lebanon-jordan.
An additional EIA study will be undertaken for the amended treated wastewater storage and conveying project in Lebanon under output 3.4. Upon completion, the study will equally be posted on the website.

The project is designed to generate positive economic, social and environmental impacts, using inputs from especially women and youth and DPs and host communities in target communities and by incorporating best practices from other projects. Consultation to comply to the AF ESP and GP have been completed – see Part II.I, Annex 3 and above publications The adaptation actions proposed have been selected together with ministries (through already established project steering committees), mayors, and community and vulnerable group representatives, making sure they are culturally and specific area-appropriate

Summary of outcomes:
Principle 1: Relevant laws and standards have been identified, including how the project and sub-project / outputs comply. Principles, 2,3 and 5, detailed stakeholder mapping has been conducted, vulnerable groups consulted and an inclusive assessment, planning and management approach for project implementation proposed. Principle 4 and 6: the human rights and core labour rights not ratified have been identified and relevant agencies consulted to identify related potential risks and mitigation measures. Principle 7: no indigenous groups were identified in the target areas. Principle 8: all involuntary resettlement will be avoided; all interventions will be on public land or in building of which owners and managers agreed with the proposed interventions. Principle 9 and 10: no protected natural habitat would be harmed, as confirmed by IUCN. 11 and 12: project activities may result in small increase of energy use. This will be compensated through installation of PV. Principle 13. Although project activities aim to improve water quality, there may be a risk that the quality does not comply to standards. Risks mitigation measures are in place to reduce the risk. Principle 14, no heritage sites were identified in the target areas (as per

UNESCO website). Principle 15: lands and soils will not be affected negatively as all proposed interventions have a sustainable land use planning approach and won't touch vulnerable soils. For more info see Part II.F, Part II.I and annex 3, 4 and 5.

Table 19: Overview of the environmental and social impacts and risks. For more details see section annex 4.

Checklist of environmental and social principles	Principle triggered during risks screening	Justification. (For potential impacts and risks see annex 4 and country-specific assessments conducted)
Compliance with the Law	No	All relevant rules, regulations and standards have been identified for all proposed project activities, including procedures / steps to comply to these.
Access and Equity	No	All project beneficiaries (i.e. population; groups) have been mapped for each project activity / output. Community consultations and focus groups discussions have been conducted per beneficiary group to identify possiblerivals, disputants and concerns related to equal access of project benefits
Marginalized and Vulnerable Groups	No	All project beneficiaries (i.e. population; groups), including marginalised and vulnerable groups have been mapped for each project activity / output. Desk research, expert consultations and community consultations and focus group discussions have been used to identify possible risks / adverse impacts of project activities on marginalized and vulnerable beneficiary groups (i.e. specific needs, limitations, constraints and requirements of groups).
Human Rights	No	Possible project human rights issues have been identified by assessing whether Jordan and Lebanon are cited in any Human Rights Council Special Procedures, and to confirm and understand possible issues through consultations with 'experts.' Communities have also been consulted about possible human rights issues with the purpose of design activities appropriately
Gender Equity and Women's Empowerment	No	All project beneficiaries (i.e. population; groups), including women and youth have been mapped for each project activity / output. Desk research, expert consultations and community consultations and focus group discussions have been used to identify possible risks / adverse impacts of project activities on women and youth. A annex containing a gender assessment has been developed
Core Labour Rights	No	Possible Core labour rights compliance issues have been assessed by analysing if Jordan and Lebanon ratified relevant conventions and by understand possible issues through consultations with ILO
Indigenous Peoples	No	No indigenous people are present in the project / programme target areas.
Involuntary Resettlement	No	No physical or economic displacement will take place due to the project/programme. This has been determined by mapping project target sites land ownership (private, public) and land use, also informally, and through consulting communities / users on the possible risk of resettlement and to get agreement on proposed interventions (i.e. no interventions will take place without the consent of inhabitants in the targeted areas). Land owners, private or public, have agreed with using their land for project activities.
Protection of Natural Habitats	No	It has been checked if any critical natural habitats exist in the target location, including their location, characteristics and critical value (i.e. legal protection status, common knowledge or traditional knowledge), as well as possible negative impacts on these due to project activities. This has been done by checking IUCN Red list and by consulting IUCN (regional office)
Conservation of Biological Diversity	No	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).
Climate Change	No	Although very limited, energy use could be increased because of pumping of water from WWTP to farm lands. To compensate for this, PV will be installed at the plants
Pollution Prevention and Resource Efficiency	YES	An analysis of possible risks of inefficiencies in energy and material resource use and waste and pollution risks of each activity has been conducted. Irrigation of waste water from the Zahle WWTP for instance has been designed to serve farmers through a gravity system. There may be a small risks of contamination of soil, surface water and groundwater because of project activities at WWTP. Therefore some risks mitigation measures are put in place.

Public Health	YES	To avoid potential negative health impacts for project activities and other activities safety signs and equipment will be provided in line with core labour rights (155 and 187). Although the project intends to improve the quality already used for irrigation, water quality monitoring is required. The same accounts for the rainwater harvesting and greywater treatment and reuse interventions. Therefore some risks mitigation measures are put in place to make sure there will be no health risks because of water use.
Physical and Cultural Heritage	No	It has been checked if physical or cultural heritage sites are present or near project sites, as well as possible risks of impacts on these due to project activities. UNESCO listed Heritage sites in target area: Anjar has been identified as a heritage site in Lebanon (in the district of Zahle). However, this is not in the target areas
Lands and Soil Conservation	NO	The project ensures no negative impacts lands and soil conservation will result from project activities. All proposed project activities aim to enhance sustainable land and soil use, especially for agriculture use. No major excavations will take place, The proposed intervention will reduce the loss or degradation of the soil, reducing any related risk.

PART III: IMPLEMENTATION ARRANGEMENTS

a. Arrangements for project management

The following arrangements for project management (oversight, coordination and execution) have been agreed upon with AF Das, the project steering committees and Execution Partners in Jordan and Lebanon.

Figure 15.1: Project Organigram
LARI will provide technical backstopping to Outputs 2.1, 2.6, 2.9 and 3.9.
RTO will undertake technical backstopping to some of the activities under component 4.

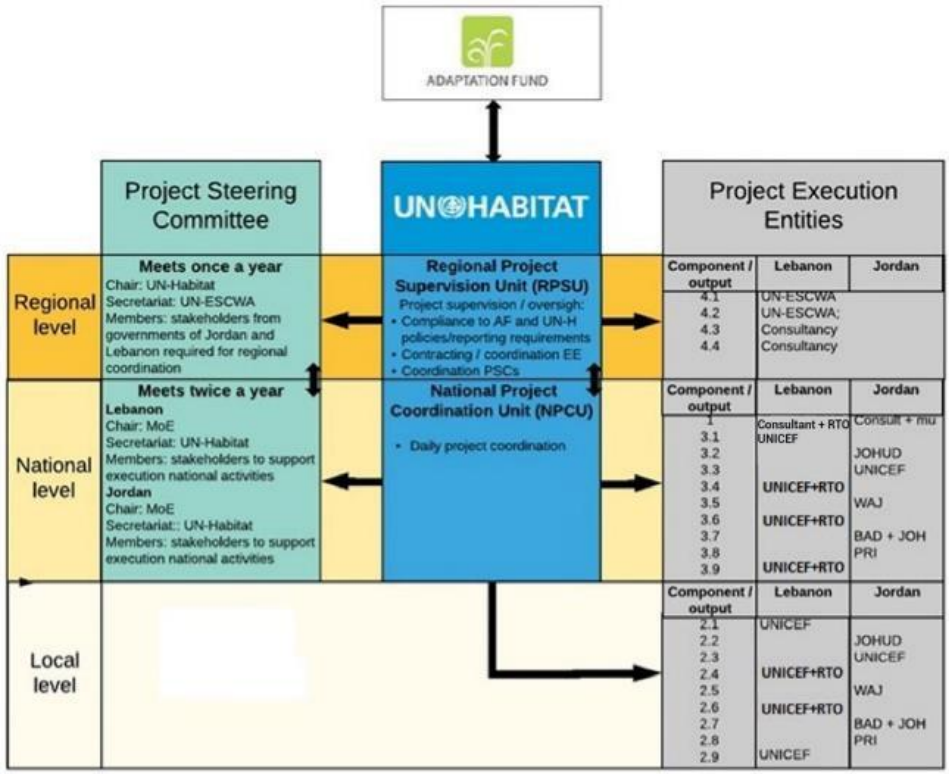
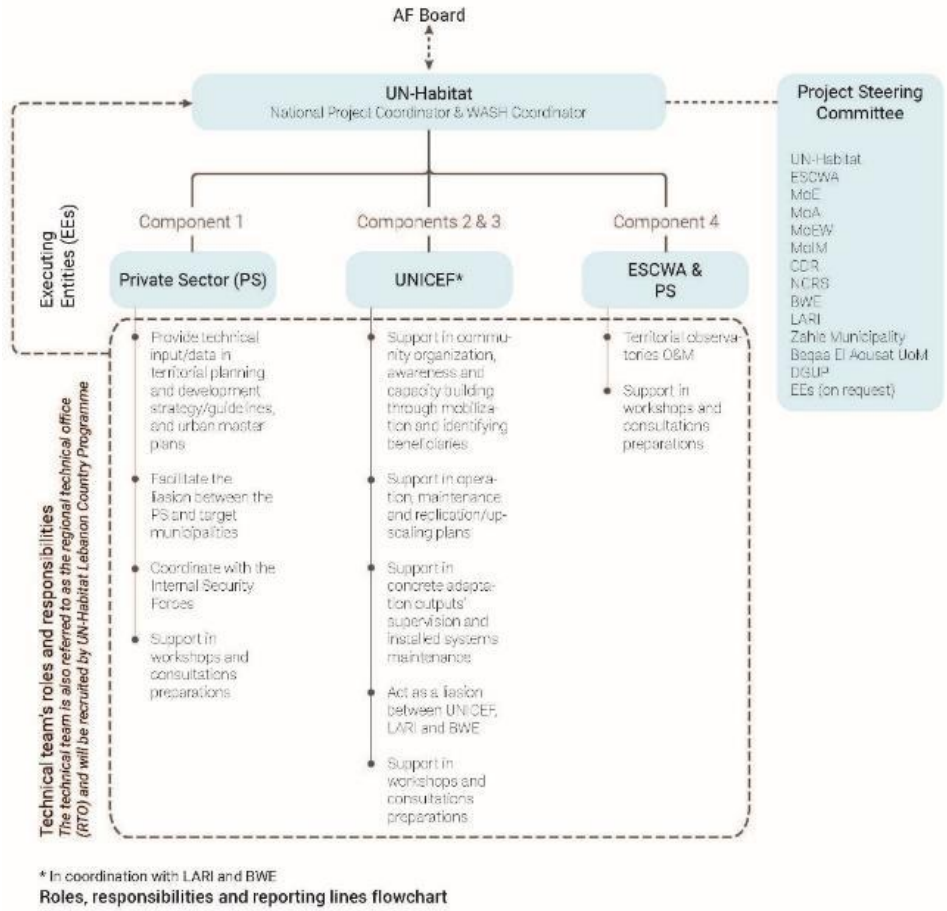


Figure 15.2: Roles, responsibilities and reporting lines flowchart



* In coordination with LARI and BWE

Roles, responsibilities and reporting lines flowchart

Table 20: Key project organigram stakeholders and roles and responsibilities

Stakeholder	Role and responsibility
UN-Habitat	Project oversight / supervision and coordination Compliance with AF and UN-H policies and reporting / M&E requirements, incl. safeguarding system Contracting and coordination execution partners Coordination with Project Steering Committees to execute project components / activities Establishing/hiring the Regional Technical Office (local technical team) – located at LARI premises – who will be responsible to follow up on Programme activities (all 4 components), coordinate with various partners and report the progress of the works to UN-Habitat Lebanon Country Programme (See **Figure 15.2**) UN-Habitat will not incur any additional costs to the budget originally approved by the Board to recruit the local technical team in Lebanon. The reserved budget lines for the recruitment of the RTO are titled "Sub-Project Coordination" in the approved budget sheet – and are found under each output (See Annex 6: Budget notes).
Project Steering Committees	Providing technical inputs to ensure smooth implementation of the project from start to completion, including providing advice on how to deliver project outputs and the achievement of project outcomes in a timely matter in line with national and sub-national strategies and technical standards: Required coordination with relevant ministries and authorities Approve annual work plans and review key project periodical reports; Review any deviations and consider amendments to work plans and contractual arrangements.
Project Execution Entities	Execute specific project components / activities

The organigram above (Figure 15) shows how the project will be supervised, coordinated and executed at the regional, national and local level. As UN-Habitat is the Multilateral Implementing Entity (MIE) of the project, UN-Habitat will be responsible for the overall implementation of the project, including contracting of execution partners and coordination with stakeholders that have a 'stake' or say in the project, mostly through Project Steering Committees.

Regional level: at the regional level, project implementation will be supported through a **Regional Project Supervision Unit (RPSU)**. This 'Unit' will be responsible for project supervision / oversight, including coordination with and between **National Project Coordination Units (NPCUs)**, the **Regional-level Project Steering Committee** (**PSC**) and the **Project Execution Entities** (**PEE**). The Regional Project Supervision Unit will be responsible for ensuring project compliance with the AF and UN-H policies and reporting requirements, for contracting the Project Executing Entities and it will chair the Regional-level Project Steering Committee. It will also support on climate change and guide the community of practice. This Regional-level Project Steering Committee will be responsible for 'steering the 'whole' project from start to completion and for ensuring that the regional component (i.e. component 4) of the project is realized.

National level: at the national level, project implementation will be supported through **National Project Coordination Units** (**NPCUs)**. These 'Units' will be responsible for daily project coordination in Jordan and Lebanon, including coordination on execution of the project activities with the Project Execution Entities. The 'Units' will also be a member of the **National-level Project Steering Committees (PSCs)** in Jordan and Lebanon. These National-level Project Steering Committees will be responsible for 'steering the country specific project activities from start to completion.

Local level: at the local level, project implementation will be supported through the **National Project Coordination Units** (**NPCUs).** The **National-level Project Steering Committees (PSCs)** will also have (government) representatives from the sub-national level, including from the target municipalities.

Table 21: Stakeholders in the project steering committee

Project Steering Committees (PSC)			
Stakeholders	Regional	National	
		Lebanon	Jordan
UN-Habitat	**Chair**	Member	Member
UN-ESCWA	Co-chair	Member	Member
Lebanon MoE	Member	**Chair**	
Lebanon MoEW	Member	Co-chair	
Lebanon CDR		Member	
Lebanon Bekaa Water Establishment		Member	

Lebanon Litani River Authority		Member	
Lebanese Agricultural Research Institute (LARI)		Member	
Lebanon Municipality of Zahle	Member	Member	
Lebanon Municipality of Bar Elias	Member	Member	
Lebanon Execution Entities	On request	On request	
Jordan MoEnv	Member		**Chair**
Jordan MoPIC	Member		Member
Jordan MoWI			Co-chair
Jordan MoLA			Member
Jordan MAIAHP			Member
Jordan MoE			Member
Jordan Municipality of Irbid (GIM)	Member		Member
Jordan Municipality of Mafraq (GMM)	Member		Member
Jordan Execution Entities	On request		On request
Total	**9 + invitees**	**10 + invitees**	**10 + invitees**

In both Lebanon and Jordan, The National-level Project Steering Committees have been established, and chairs, co-chairs and members have already been identified and agreed upon. These Committees have already been functioning to support the development of this project proposal, including approving proposed Project Execution Entities, activities, budgets, etc.

Key stakeholders and roles and responsibilities

Table 22: overview main stakeholders and roles and responsibilities

Regional level

Stakeholder	Role and responsibility	
	Current	Project
UN-ESCWA	Regional coordination between governments in Arab region, including on climate change and urban agenda	Co-chair PSC at regional level Execution component 4 Coordination execution component 4 at national level

National and local level – Lebanon

Government			
Stakeholder		Role and responsibility	
Main	Sub + Commissions	Government	Project
Ministry of Environment (MoE)	AF DA Office of the Minister Climate Change Department Urban Environment department	Manage the environment through policies, plans and legislation, including conserving water resources	Member PSC at regional level Chair of the PSC at national level Policy advice and coordination and focal point on national Environmental and Social Policies and standards compliance Scaling up adaptive measures to mitigate pollution to water bodies through the environmentally friendly and sound interventions.
Ministry of Energy and Water (MoEW)	Office of the Minister Water Resource department	Manage water resources and energy through policies, plans and legislation	Member PSC at national level Advise on execution component 3 on Wastewater reuse and diversion, also on O&M. Scaling up wastewater reuse and climate adaptive measures related to water scarcity.
Council for Development and Reconstruction (CDR)	Water resources department	Engages in all phases of project implementation from planning, feasibility analysis, detailed design, bidding, expropriation, execution, and operation and maintenance of most public facilities on the behalf of the Government	Member PSC at national level Policy advice and coordination, including to comply to project national standards for public facilities Operation and Maintenance of large projects until handed over to Water Establishments.

Bekaa Water Establishment (BWE)	Office of Director General Water resources department	Applies strategies and master plans for the Bekaa area, done in collaboration with the MoEW; Operation and Maintenance of water and wastewater facilities and main networks. Provision of Water services. In charge of monitoring water resources and the measurement of flows, estimation of water needs, allocation of water resources in all of the Bekaa regions.	Member PSC at national level Advise on execution component 3 especially on the operation and management of water and wastewater facilities (operates under the MoEW)
Lebanese Agriculture Research Institute (LARI)	Director	Working under the supervision of the Minister of Agriculture; conducts research and experiments to solve problems facing the agricultural sector in this area; Has at its disposal eight experimental stations in an area of 280 hectares of agricultural land; Keeps close ties to the farmers and tries to develop research activities aiming at solving their problems.	Member PSC at national level Advise on the execution of/provide technical backstopping to Outputs 2.1, 2.6, 2.9 and 3.9 (operates under the MoA) Scaling up and training more farmers to adopt climate change adaptive measures in agriculture.
Municipality of Zahle	Public works committee of both municipalities Municipal council members	Manage all public work projects, including water, electricity, and garbage collection according to law 118/1977; Public works and infrastructure implementation spent for municipal budget. Operation and maintenance Municipalities are responsible for managing unconventional water sources and supply within their boundaries, such as rainwater harvesting; Municipalities are also responsible for developing and managing municipal master plans in coordination with DGU	Member PSC at regional level Member PSC at national level Policy advice and coordination, including to align with local plans Advise on the execution of components 1 and 3
Municipality of Barr Elias			Member PSC at regional level Member PSC at national level Policy advice and coordination, including to align with local plans Advise on execution component 1 and 3 and especially adopting construction measures to harvest rainwater in new constructions.
Municipalities of Hazerta, Bar Elias, El Marj, Saadnayel, Taanayel, Taalabaya, Terbol, Ferzol			Member PSC at national level Policy advice and coordination, including to align with local plans Advise on execution component 1 and especially tackling climate change adaptive measures in territorial planning.
Non-government			
UNICEF		Coordination of the inter-agency humanitarian response of the education and water sector and the child protection sub-sector in support of the Government; main government partner on WASH	Execute fully components: 2 and 3 in close coordination with LARI, BWE and other involved stakeholders.

National and local level – Jordan

Government			
Stakeholder		Role and responsibility (policy / M&E, implementation, etc)	
Main	Sub + Commissions	Government	Project
Ministry of Environment (MoEnv)	AF DA Directorate of the Climate Change	Manage the environment through policies, plans and legislation, including conserving water resources	Member PSC at regional level Chair of the PSC at national level Policy advise and coordination and focal point on national Environmental and Social Policies and standards compliance

Ministry of Planning and International Coordination (MoPIC)	International Cooperation Department Local Development & Enhanced Productivity Programs	Responsible for improving development policies and promoting active participation in the process, including coordinating and managing the necessary funding for development projects; responsible for preparing and updating Joint Response Plan (JRP) for Syrian crisis	Member PSC at regional level Member PSC at national level Policy advise and coordination, especially on JRP and platform
Ministry of Water and Irrigation (MoWI)	Climate Change Unit, Wastewater and sanitation Affairs (Design and Feasibility Study Directorate and Supervision and Technical Support Directorate), and Water Demand Management Directorate)	Manage water and irrigation through policies, plans and legislation. Awareness and Media Unit established a showcase room of water saving devices in the ministry	Member PSC at national level Policy advise and coordination, including to comply to national water strategies, plans and policies Advise on execution component 3 on rooftop water harvesting (JVA) and the showcase rooms in municipal government buildings
Ministry of Local Administration (MoLA)	Zoning Directorate, Legal Unit, Higher Planning Council	Technical, financial and administrative advisor for all the local councils in the Kingdom	Member PSC at national level Policy advise and coordination, including on execution component 4: adopting a national programme for water harvesting from rooftops at municipal levels in the project selected governorates, incl. providing incentives/ exemption to encourage the installation of rainwater harvesting and scale it up at national level
The Ministry of Awqaf Islamic Affairs and Holy Places (MAIAHP)	Construction and maintenance department, Directorates of Awqaf at Irbid and Mafraq Governorates	Responsible for the Hajj & Umrah, Mosques –their reconstruction, rehabilitation, their needs and workers (Imam, etc)-;	Member PSC at national level Policy advise and coordination on activities in Mosques Facilitate(d) coordination with Directorates of Awqaf in Irbid, Ramtha and Mafraq to select Mosques where activities related to greywater reuse and rooftop rainwater harvesting will be implemented. Contribute to the public awareness campaigns and training in Mosques (through Imam) Directorates – Supervise the O&M of the installed systems in mosques
Ministry of Education (MoE)	Directorate of Education in Iribd and Mafraq	Responsible for the Jordanian educational system	Member PSC at national level Facilitate(d) coordination with Schools Building Directorates in Irbid and Mafraq to select schools where activities related to rooftop rainwater harvesting and greywater reuse will be implemented. Provide capacity building and trainings to M. Of Education's building directorates' engineers Directorate – Contribute to the public awareness campaigns and training on the operation and maintenance of the installed systems at schools.
MoWI / Yarmouk Water		Management of water in the north sector in accordance with the provisions of the Jordanian companies Law No. (22) of 1997, which is wholly owned by the Jordan Water Authority.	Execute interventions related to enhancement of the treated wastewater quality and the management of its reuse by farmers in Mafraq, Maerad and Al Akaider around the WWTPs.

			Continue to monitor the performance and operation of installed infrastructures and used treated effluent quality. Facilitate coordination with farmers Manage the reuse of reclaimed water by farmers, local NGOs and WUAs. Support the public awareness campaigns related to installation of WSDs
Greater Irbid Municipality (GIM)		Manage all public work projects, including water, electricity, and garbage collection. Municipalities are responsible for managing unconventional water sources and supply within their boundaries, such as rainwater harvesting; Municipalities are also responsible for developing and managing municipal master plans	Member PSC at regional level Member PSC at national level Policy advise and coordination, including to align with local plans Advise on execution component 1 and 3, esp. water harvesting, incl. enforce the installation of rooftop rainwater harvesting system and tanks and issue relevant permits Facilitate coordination with other local authorities and stakeholders
Greater Mafraq Municipality (GMM)			Member PSC at regional level Member PSC at national level Policy advise and coordination, including to align with local plans Advise on execution component 1 and 3, esp. water harvesting, incl. enforce the installation of rooftop rainwater harvesting system and tanks and issue relevant permits Facilitate coordination with other local authorities and stakeholders
Non-government			
The Jordanian Hashemite Fund for Human Development (JOHUD)		Johud is a local Non-Gove rnmental Organization which has 51 Community Development Centers (CDCs) throughout the kingdom targeting the less fortunate groups, and remote and poor communities. Their work focuses on promoting water conservation awareness and providing livelihood opportunity in agriculture, water, energy and environment.	Executing interventions related to rainwater harvesting from rooftops of mosques, schools, selected households and municipal buildings in addition to manage the treated wastewater reuse intervention in the farmlands around Maerad andAl Akaider WWTPs and establish new and efficient irrigation technology. Capacity building and training on the installation of the irrigation system.
UNICEF		UNICEF is WASH sector lead in Jordan and their work focuses also on education and child protection in support of the Government. They have implemented WASH related activities in the Syrian refugee camps in Jordan.	Executing component 3, the intervention related to grey water treatment and reuse in schools and mosques.
The Hashemite Fund for the Development of Jordan Badia		The fund is mandated to establish the concept of sustainable development in the Jordan Badia by implementing environmental, social and economic projects, while maintaining and respecting the existing culture and habits. The implemented a number of projects related to treated wastewater reuse, fodder cultivation enhancement and livestock production	Execute and manage the treated wastewater reuse intervention in the farmlands around the treated wastewater reuse intervention around Mafraq WWTP and establish new and efficient irrigation technology. Capacity building of farmers and public awareness on water management and efficient irrigation systems.
Permaculture Research Institute (PRI)		PRI is a not-for-profit organisation, specialized in education, training and practical applications of permaculture design worldwide.	Execute the permaculture intervention at Local University / Research Centre~~the Jordan University of Science and Technology (JUST).~~ Provide capacity building and training to ~~(JUST).~~ Local University / Research Centre

Legal and financial arrangements
UN-Habitat and the ministries of Environment (with the AF DAs) in Lebanon and Jordan will sign a joint **Memorandum of Understanding** to which this Project Document will be attached, to ensure that all partners are fully committed to the project.

UN-habitat will contract Project Execution Entities in Lebanon and Jordan through **Memorandum of Understanding (MoU) or Agreements of Cooperation (AoC)**, which are legally binding financial tools, and **UN to UN agreement** to contract UNICEF and UN-ESCWA. The contract will be negotiated by the Regional Project Supervision Unit and cleared by UN-Habitat ROAS / HQ. For the UN-to-UN agreements, indirect overheads will be deducted from implementing entity fee share to avoid double charge. Any additional indirect cost shall be compensated by the concerned executing partner from a different source of funding without any implication on the direct costs of project outputs.

The Regional Project Supervision Unit will develop an operational manual that clearly outlines the roles and responsibilities of the key project stakeholders and contain all the necessary tools, forms and templates required to administer the project. The operation manual will be shared with the National Project Coordination Units for inputs. While UN-Habitat takes responsibility of audits in line with AF requirements (each year), all contractors will be required to have 'external' audits of their budgets. The contractors will also be required to support the independent final evaluation.

Roles and responsibilities for environmental and social risks management / AF ESP and GP compliance
The Regional Project Supervision Unit will be responsibility for environmental and social risks management, including implementation of the Project ESMP. An AF and UN-H policies and reporting compliance expert will be part of the RPSU. This expert will also supervise Project Execution Entities on the implementation of the Project ESMP. Guidelines showing how to comply to the AF ESP and GP will be shared with all execution entities and they will be guided on process, including monitoring. A Safeguarding system compliance expert will also be part of the RPSU. Monitoring staff part of the RPSU will require having expertise in social risk management and be familiar with the AF safeguarding system. The RPSU will be backstopped by UN-Habitat HQ, with experts on climate change, human rights, environmental and social risks managements and gender policies.

In both Lebanon and Jordan government stakeholders responsible for compliance to national environmental and social policies and standards will be part of the Regional- and National-level Steering Committees, as well as government gender focal points.

All project-related ToR's and contracts will include clauses stating contractors will need to comply to the AF ESP, especially principle 1 (law), 4 (human rights), 5 (gender) and 6 and 13 (labour and safety) and the AF GP.

Adaptive management: when changes in project activities or additional activities are required, these will need to go through a new risks screening and impact assessment process in compliance with AF, UN-habitat and national policies and standards. When this is required, this will be led by the RPSU and the Regional-level Project Steering Committee would need to approve the changes. For instance, when allocated budget allow targeted additional buildings for installing RWH systems, this would be possible following above process.

Launch of the project
At the launch of the project, UN-Habitat's, together with UN-ESCWA will organize **an inception workshop** inviting members of the Regional-level Project Steering Committees, Execution Partners and other key stakeholders. The project approach and the proposed outputs and outcomes of the project will be presented and discussed with the purpose to solicit feedback and inputs in a participatory manner. Comments and feedback will be incorporated in project frameworks and workplans. The Inception Workshop aims to:

(i) Enhance participants' understanding of the project objectives and activities and take ownership of the project

(ii) Discuss and confirm the organizational structure of the project, including roles and responsibilities
(iii) Confirm / agree upon project monitoring framework and workplan
(iv) Confirm / agree upon project risks management framework
(v) Discuss and agree upon project knowledge management framework and plan
(vi) Confirm / agree upon the project Environmental and social Risks Management Plan
(vii) Agree on the annual work plan for year one.

The inception workshop will be organised within three months after signing the project agreement between the Adaptation Fund and UN-Habitat.

This project will conduct a climate change mandate segregation exercise at the inception phase to differentiate the confusing climate change roles of the national government (Ministry of Environment/Ministry of Local Administration-Municipalities) versus the roles of the local (municipal) level as this will be the unique contribution (credit card) of this project. Since this project creatively proposes to have the staff of the to-be-established Urban (Municipal) Observatories as the entities in charge for climate change function at municipalities, the needs of the staff of such Urban Observatories will be assessed at the inception phase of the project and robust mandate/ToR will be drafted for them and based on that their training needs and capacity gaps will be determined much more clearly.

B. Measures for financial and project risk management

Under guidance of the regional project manager, supported by the National Project coordinators, Monitoring Officers will monitor the status of financial and project management risks, including those measures required to avoid, minimise or mitigate these risks, throughout the project (please see also Section Part III.D).

The table below gives an overview of overall potential project management and financial risks, an assessment of the significance of the pertaining risks in terms of likelihood and impact and outlines measures that have been embedded in the project design in order to manage and/or mitigate these risks.

Table 23: overview of financial and management risks and measures to mitigate these

Potential risks	Likelihood (1-5)	Impact (1-5)	Mitigation measures	Indicator to verify
Institutional				
1 Delay of project start-up because critical staff is not in place and / or lengthy contracting process, incl. negotiations with execution entities	3 Med	3 Med	1.1 UN-Habitat appointed critical staff at UN-H ROAS to start the process required to start the project, incl. putting project staff in place and preparing the inception workshop immediately after signed project agreement between UN-Habitat and the AF; 1.2 All execution entities have been identified and proposed project activities and budgets have already been agreed upon. 1.3. UN-habitat commits to organise the inception workshop within three months of the signed project agreement between UN-Habitat the AF	The inception workshop was organised within three months of the signed project agreement between UN-Habitat; Execution entities to execute activities in the 1st project year are contracted within six months after the inception workshop
2 Loss of government support (at ministerial and municipal level) for the project and activities because of elections and related functions of the project steering committee, which may result in lack of prioritization of AF project activities or different pace of	1 Low	3 Med	2.1 National Project Steering Committees (PSCs) have already been formed during the project preparation phase and these have approved proposed project activities and budgets, etc. This shows a participatory and inclusive project design process took place with ownership of the project as a result. If due to elections, new members of the PSCs will need to be selected, this will be requested by UN-Habitat and AF DA as soon as possible and records of decisions made during earlier PSC will be shared. 2.2 Delays in one country don't have to result in delays in the other country because of functioning national PSCs	Confirming steering committee members and roles and responsibilities during inception workshop + report Government focal point to coordinate SC appointed at inception workshop MoU signed within 6 months six months after the inception workshop

execution of activities in Jordan and Lebanon			2.3 UN-Habitat will establish agreements with the MoE in Lebanon and MoEnv in Jordan (with non-changing AF DA) (through MoUs) to ensure above	
3 A lack of coordination between and within national government Ministries and Departments and municipalities	1 Low	3 Med	3.1 Regional and National PSCs are to ensure coordination. Representatives from the target municipalities are members of both regional and national PSC. 3.2 Roles and responsibilities related to project implementation of PSC members, also for operation, maintenance and sustainability of activities, have already been identified and focal points within the ministries and municipalities will be appointed through an official letter. 3.3 Should UN-Habitat observe coordination problems, the agency will try to resolve issues directly with government focal point and / or concerned parties	See above
4 Capacity constraints of executing entities, local institutions, communities and the private sector may limit the effective implementation of interventions	1 Low	3 Med	4.1 The project has a strong capacity building and training component (component 2), designed to operate, maintain, sustain and replicate project activities, esp. at the community level 4.2 UN-Habitat will have dedicated project staff with expertise in spatial / urban planning, climate change, community organization and technical design, M&E and safeguards to ensure quality control from UN-Habitat side.	Capacity building indicators to be established Critical staff as mentioned being part of project staff
5 Communities may not adopt activities during or after the AF project, including infrastructure maintenance	2 Low	4 High	5.1 A strong participatory approach at the community level is used and will be used (component 2) during project implementation to ensure ownership and support of communities to the realised interventions in the targeted project areas. UN-Habitat works with UNICEF and NGOs partners already well established in the target area, to build on relations already established. 5.2 Capacity building and training of communities will be undertaken to improve their awareness and understanding of the benefits of the activities, including infrastructure operation and maintenance (component 2).	See above
Financial management and Requisite Institutional Capacity				

6 Complexity of financial management and procurement. Certain administrative processes could delay the project execution or could lack integrity or needed capacity	2 Low	2 Low	6.1 Financial management arrangements have been defined during project preparation, including identification of all executing entities, which already agreed on the activities and budgets (see also 1.2. above); 6.2 UN-Habitat's control framework, under the financial rules and regulations of the UN secretariat, will ensure documentation of clearly defined roles and responsibilities for management, internal auditors, the governing body, other personnel and demonstrates proof of payment / disbursement; In line with AF and UN-Habitat policies, audits will take place annually and / or for each contract of USD 500k. 6.3 Activity specific procurement will be managed by the executing entities as agreed through standard Agreements of Cooperation (with relevant conditions, incl. evidence of recognised procurement policies and procedures and specific terms and conditions for timely disbursement of funds for project activities while at the same time ensure provisions on good financial management, hence minimizing the risk of fund mismanagement or corruption). The RPMU has a certifying role (for key procurements / expenditures).	Timely audit reports (inception and yearly + following UN-H regulations) Timely evidence of recognised procurement policies and procedures provided by Execution Entities
7 Inflation and instability of the national currency leading to budget issues and increased prices for infrastructure delivery	3 Med	1 Low	7.1 All budgets will be in US$ 7.2 Include clauses in all contract, incl. with private sector, that they can't increase the costs during the project duration.	All budgets in US$ Clauses in all contract, incl. with private sector, that they can't increase the costs during the project duration.
8.The discrepancy between the official and black-market exchange rates of the US dollar might jeopardize the engagement of public entities as executing partners	3 Med	3 Med	8.1. Identify executing entities that can receive dollars without being impacted by negative exchange rates 8.2. Discuss the possibility with the AF to do procurements / recruitment of supervision staff or executing entity directly through UN-Habitat, or by third party.	Amount of disbursed budget for all activities and targets VS initial approved budget with AF. *This indicator will show that target and activities are not affected by currency related issues as they will be disbursed as approved by AF.* Percentage of contracts with executing entities. *This indicator shows that the percentage of contracts with EEs will be maintained as per the approved documents with AF, the expected answer for this indicator at the end of the funding period should be 100%.* *Annual audits statement of external auditor*
Physical				
9Political instability and COVID-19 in the target localities inhibits movement and access to target areas	1 Low	4 High	8.1 The selected project sites are labelled as being safe. However, UN-habitat will only let field work proceed if agreed with the UN security unit and in line with COVID-19 procedures 8.2 Execution entities will require having permanent field staff at project sites, recuing the need to travel	Permanent field staff at project locations

			7.3 If target areas are not accessible, UN-Habitat and the proposed execution entities will identify alternative intervention locations and request approval from the SC and AF	
Environmental				
10Poor weather conditions (especially in winter) affect implementation of activities	2 Low	1 Low	9.1 UN-habitat and the proposed execution entities have developed their work plan according to expected weather conditions and the majority of activities should be able to be carried out despite severe weather conditions as they are inside closed areas. If unexpected weather patterns occur, the proposed activities and work plan will be reviewed to make practical adaptations.	Work plans avoiding critical concrete works being planned in winter

C. Measures for environmental and social risks management

Part II.L of this proposal shows the outcome of the environmental and social risks screening and impacts assessment that has been conducted for this project to comply to the AF ESP and GP. Part II.I describes the consultation process conducted to support the development of this proposal, including for this project to comply to the AF ESP and GP. In annex 3 it shows what consultations have been conducted to identify potential environmental and social risks and impacts, including with key stakeholders such as government and UN agencies and beneficiary groups (i.e. potentially vulnerable groups, including women and youth). Part III.A describes the allocated roles and responsibilities for environmental and social risk management, including for the implement of the project ESMP. A designated budget for environmental and social risks management, including the implementation of the ESMP, has been included in part III.G. In Annex 4, all the details of the risks screening, impact assessment, ESMP, incl. the risks monitoring system and budget, are provided.

Based on the screening against the 15 AF principles, the project has been categorised as a "B" category project in terms of the environmental and social risks it poses.

According to the Jordan's EIA Regulations, particularly the EIA By-Law No. 37 of the Year (2005), the project has been categorized as "*Category III*" project, which imply that the proposed interventions in Jordan have no considerable risks or adverse impacts, thus not requiring full EIAs. This is due to the fact that all of the construction activities and installations of proposed sub-projects are not substantial and will be constructed or installed in already built and operating facilities, such as fully-functioning WWTPs, which at the time of original construction have been subjected to MoEnv's incumbent EIA regulations and supervision. However, although no impact assessments were required by national law, a full ESIA and ESMP report has been developed for the proposed project activities / outputs in Jordan, accompanied by a consultations report.

According to Lebanese decree 8633 MoE, 2012, Annex 1, except for amended output 3.4 for which a full EIA study is required, all the other proposed project activities / outputs don't required full EIAs. Similarly to Jordan, all of as the associated construction activities and installations are not substantial and will be constructed or installed in already built and operating facilities. To comply to the AF requirements, risks screening and impact assessments have also been conducted for all proposed project activities.

Country specific ESIA-ESMP and consultation reports can be found here: https://unhabitat.org/af-lebanon-jordan

Table 24: ESP and GP compliance requirements and how the proposal complies to these requirements

ESP and GP compliance requirements	Project compliance to the AF ESP and GP	Reference / evidence

Have all potential environmental and social risks been identified for *all* project/programme activities prior to funding approval?	All potential environmental and social risks (incl. for gender and considering their significance) have been identified) for all project/programme activities at the project preparation phase. In both Jordan and Lebanon, accredited consultants prepared country-specific ESIAs, ESMPs and consultations reports in compliance with the AF ESP and GP and national requirements for conducting ESIAs; Outcomes have been consolidated in the proposal	Part II.I Part II.L Annex 4 (ESP annex) Annex 5 (GP assessment annex)
Has the environmental and social assessment been completed before the project/programme proposal submission to the Adaptation Fund, and its findings included in the proposal document?	In compliance with the AF ESP and GP and national requirements for conducting ESIAs, above reports have been reviewed and approved by the Jordan and Lebanon ministries of environment. Outcomes have been consolidated in the proposal. However, in view of the proposed amendment in output 3.4, an additional EIA study is needed and will be prepared upon approval of amendment request and before the startup of project implementation.	https://unhabitat.org/af-lebanon-jordan
Has an ESMP been developed and does this include safeguard measures to be implemented during a project/programme?	A project ESMP has been developed, including safeguarding measures. The following has been included in the ESMP: Allocated roles and responsibilities environmental and social risk management / implement of the ESMP Opportunities for adaptive management Arrangements to supervise executing entities for implementation of ESMP Budget provision to manage environmental and social risks / implement of the ESMP Measures to avoid, minimize, or mitigate potential risks Risks monitoring system / indicators Grievance mechanism	Part III.A (roles and responsibilities for env. and social risk management) Annex 4 (ESP annex)
Will a grievance mechanism be put in place and how will it be made widely known to identified and potentially affected parties	A project grievance mechanism will be put in place, as described in the ESMP. It will be made widely known to identified and potentially affected parties through community mobilisers, posters and online content	Annex 4 (ESP annex)

D. Arrangements for monitoring, reporting and evaluation

M & E Framework and plan

Monitoring and Evaluation (M & E) arrangements for this project will be in compliance with the AF M&E guidelines and ESP and GP and with UN-Habitat M & E policies and guidelines. This means, as a minimum, the following will be monitored and evaluated: project Milestones, Financial data, Procurement data, Risks assessment, ESP Compliance, GP Compliance, Project indicators, Lessons learned, project Results. The M & E of progress in achieving project results will be based on targets and indicators (also for gender) established in the Project Results Framework (see Part III.E).

The annual project performance reports (PPRs) will include a section on the status of implementation of any environmental and social management plan, including those measures required to avoid, minimize, or mitigate environmental and social risks. The reports shall also include, if necessary, a description of any corrective actions that are deemed necessary. The terminal evaluation report will include an evaluation of the project's performance with respect to environmental and social risks.

UN-Habitat will ensure timely and high-quality M & E by keeping oversight of the process by providing guidance to the Project Execution Entities and national government partners through full briefing of M & E requirements. Where possible, the M & E process will be participatory, involving key stakeholders at national, municipal and communities. Project activities will be monitored by the RPSU and NPCUs with dedicated monitoring staff, which will require having expertise of M & E compliance to the AF ESP and GP. The M & E framework and plan will also need to be endorsed by the Regional-level Project Steering Committee. Audits of the project's financial management will follow AF regulations and rules and applicable audit policies. The M&E plan will be implemented as proposed in the table below.

Table 25: M & E plan

Type of M&E Activities	Responsible Parties	Time Frame	Reporting
Inception Workshop and Report	UN-Habitat ROAS & Regional project coordinator Coordinated with: UN-ESCWA Regional-level Steering Committee	Workshop: within first three months of signing between AF and UN-habitat Report: within one month after inception workshop	Inception Report, including 1st year workplan, monitoring framework and plan; project risks management framework and plan; environmental and social risks management framework and plan; knowledge management strategy
Periodic status/ progress reports	UN-Habitat ROAS & Regional project coordinator Coordinated with: NPCUs and Project EE and IOIS	Annually	Annual Report, mid-term, final
Compliance with ESP and GP		Annual, as well as upon receipt of complaints, grievances or queries	Annual Report, mid-term, final
Audits		As per AF (annually) .	Audit Reports
Terminal project performance report		No later than one months after project completion	Terminal project performance report
Final Evaluation	UN-Habitat ROAS & Regional project coordinator Coordinated with: External consultants and NPCUs, Project EE	No later than three months after project completion	Final Evaluation Report
Community consultations / workshops / trainings, etc.	Project EE Coordinated with: NPCUs	Within one week after each event	Documentation
Visits to field sites	UN-ESCWA Coordinated with: UN-Habitat ROAS & Regional project coordinator Regional-level Steering Committee	At least every year	Field visit Report
Video with 'before' and 'after' the project	UN-Habitat ROAS & Regional project coordinator Coordinated with: UN-ESCWA Regional-level Steering Committee	Video one: before start of concrete interventions Video two: after completion concrete interventions	Video compilation of project results

For the M & E budget and a breakdown of how MIE fees will be utilized in the supervision of the M & E function, please see the detailed budget (Part III.G). For related data, targets and indicators, please see the project proposal results framework (Part III.E).

M&E Activities

a) Inception workshop and Project Steering Committee meetings

During the first Regional-level Project Steering Committee meeting, which will be organized in conjunction with the project Inception Workshop. The Committees will monitor / review project progress and provide technical guidance. During the first Regional-level Project Steering Committee meeting, the following will be reviewed: the project organizational structure, includes roles and responsibilities, the project monitoring framework and workplan, the project risks management framework, the project knowledge management framework and plan, the project Environmental and social Risks Management Plan and annual work plan for year one. The Regional-level Project Steering Committee will meet every year and the National Project Steering Committees will meet every six months, and ad-hoc meetings will be held as needed.

b) Periodic project monitoring and terminal project performance reporting

Annual project performance monitoring will be conducted using the AF PPRs template. This will include monitoring of project: Milestones; Financial data; Procurement data; Risks assessment; ESP Compliance; GP Compliance; Project indicators; Lessons learned; Project Results

c) ESMP implementation monitoring

The implementation of the project Environment and Social Management Plan (ESMP) as described in Annex 4 will be monitored. The ESMP includes monitoring indicators and responsibilities for identified potential risks, impacts and mitigation measures. A dedicated budget for monitoring the compliance to the AF ESP and GP has been included in Part III.G

d) Financial Audits
A professional, certified and independent organization will review the financial management of the project and adherence to required standards and regulations.

e) Final Evaluation
No later than three months after project completion, a final evaluation will be conducted following AF and UN-Habitat policies and guidelines. It will be conducted by an independent team of international and national experts in consultation with executing entities and national stakeholders as a participatory process.

f) Community Level Participatory Monitoring
Part of the detailed project monitoring framework and plan will be identified through activities to involve Project Execution Entities and beneficiaries at the community level in monitoring activities. This would include community-level monitoring of Gender and Youth responsiveness and impact of the project.

g) Periodic Project Site Visits
Members of the Regional-level Project Steering Committee and representatives of UN-Habitat will visit project sited and hold meetings with the local stakeholders to monitor the implementation of project activities.

h) Video with 'before' and 'after' the project
Also, as part of the knowledge management strategy and plan, a video recording project results will be produced using 'birds' eye' views and recording of project activities and beneficiaries

Reporting

a) Inception Workshop and Report
Within one month after the inception workshop, an Inception Report will be submitted to the AF and project steering committees' members. Reports will include: (i) agreement on organizational structure of the project, including roles and responsibilities; (ii) monitoring framework and workplan; (iii) project risks management framework; (iv) knowledge management framework and plan; (v) Environmental and social Risks Management Plan; (vi) year one work plan.

b) Annual project performance reports, including final report
The Annual project performance reports, which will be submitted to the AF, will include:

(1) Milestones
(2) Financial data
(3) Procurement data
(4) Risks assessment
(5) ESP Compliance
(6) GP Compliance
(7) Project indicators
(8) Lessons learned
(9) Project Results

c) Community Level Meeting /Workshop / Training Reports and site visit
Reports on all community-level meetings, workshops, and training will be prepared by Project Execution Entities within one week of the event. Photo documented site visit reports, also to monitor women participation, will also be prepared by Project Execution Entities.

d) Final Evaluation Report
Independent consultant will prepare the Final Evaluation report in line with AF and UN-habitat evaluation policies and guidelines and norms and standards for evaluation in the UN system.

E. Project proposal results framework

Table 26: Project results framework with indicators, their baseline, targets, risks & assumptions and verification means. *Beneficiaries T = Total; F = Female; Y = Youth.

Expected Result	Indicators	Baseline data	Targets	Risks & assumptions	Data collection method	Frequency	Responsibility
Project component 1: Manage urban risks and vulnerabilities in the context of climate change, esp. water scarcity challenges, and urban (population) growth, incl. from DPs migration							
Outcome 1 Strengthened municipal institutional capacity to manage climate change and DP crisis related urban water scarcity challenges by mainstreaming these aspects into spatial strategies + developing action / investment plans and guidelines (with identified solutions) to use water most efficiently within municipal boundaries *In line with AF outcome 2: Strengthened institutional capacity to reduce risks associated with climate-induced socioeconomic and environmental losses Reduced exposure to climate-related hazards and threats at the municipal level *In line with AF outcome 1: Reduced exposure to climate-related hazards and threats	No and type of targeted institutions with increased capacity to minimize exposure to climate change (in line with AF results indicator 2.1) through strategies / guidelines and urban master plans with climate change and gender mainstreamed. Number of institutions at district level Number institutions at municipal level Relevant threat and hazard information generated and disseminated through to stakeholders on a timely basis (in line with AF results indicator 1) Evidence-based Municipal plans with climate change mainstreamed in them developed, disseminated during project and operational	0 0 0	1 10 (8 in Lebanon and 2 in Jordan) 10 (8 in Lebanon and 2 in Jordan)	Assumption: Decision-makers at all levels and key sectors are willing to mainstream climate change considerations into planning and programming in a timely manner Assumption: There is a political will to embrace changes in the local and sectoral plans. Assumption: local authorities committed to fund and implement the plans Risk: lack of coordination between local and sectoral authorities for effective implementation of the municipal plans and prioritizing climate change	Collect guidelines, strategies, plans, how these are being disseminated (online) and assess if climate change is mainstreamed in it. Calculate number of target institutions and municipal plans developed and disseminated Assess if climate change and gender are mainstreamed in the plans and ensure criteria to do so are clear Means of verification: semi-annual and annual project reports, final evaluation, field visit reports	Baseline, mid-term and end	UN-H in cooperation with EE and government entities

Output 1.1. Territorial planning and development strategy / guidelines with CC and gender mainstreamed in Lebanon *In line with AF output 2.1: Strengthened capacity of national and regional centres and networks to respond rapidly to extreme weather events	% increased capacity of the staff trained to respond to, and mitigate impacts of, climate-related events (in line with AF results indicator 2.1.1) through assessment and planning processes (workshops/trainings) Number of staff / people Women participating Youth participating	0 0 0	T: 480 W: >40 % Y: >15 %	Assumption: staff will be actively engaged in the trainings Assumption: women and youth are interested and available to increase knowledge and awareness on climate change mainstreaming in urban planning and to be involved in trainings and climate change planning activities Assumption: relevant institutions –included the ones that deal with women and gender issues -have been identified and are interested Risk: cultural perceptions are strong and limit women engagement Risk: officials are overwhelmed by other tasks and have a passive and non-interactive approach towards the trainings Assess what % of neighborhoods and populations are covered by the vulnerability assessment data collected (where collected) and proposed response actions (what locations)	Workshop/training reports Participation lists and photos Women feedback reports (training reports) Youth feedback reports (training reports) Calculate number of staff from target institutions participating workshops/trainings Collect and analyse vulnerability assessment data collected and mainstreamed in municipal plans Count municipal inhabitants covered by municipal plans	Baseline, mid-term and end	UN-H in cooperation with EE and government
Output 1.2 Urban master plans at municipal level with CC and gender mainstreamed in Lebanon *In line with AF output 2.1: Strengthened capacity of national and regional centres and networks to respond rapidly to extreme weather events Municipal plans developed or modified to respond to new conditions resulting from climate variability and change In line with AF output 1.1: Risk and vulnerability assessments conducted and updated Municipal inhabitants in target areas are coved by	No. of staff trained to respond to, and mitigate impacts of, climate-related events (in line with AF results indicator 2.1.1) through assessment and planning processes (workshops/trainings) Number of staff / people Women participating Youth participation % awareness/knowledge on the need to take gender informed decisions on climate change No of municipal plans with climate change mainstreamed into them based on vulnerability data developed or adapted (in line with AF results indicator 1.1) Percentage of municipal inhabitant in target areas covered by the municipal plans	0 0 0 0 0 0	T: 240 W: >40 % Y: >15 % 50% 8 50 %				

municipal plans with climate change mainstreamed in it, including women and Syrians *In line with AF output 1.2: Targeted population groups covered by adequate risk reduction systems	Percentage of women, youth and Syrians in target areas covered by the municipal plans Above is in line with AF results framework indicator 1.2.1.)	0	50 %				
Output 1.3 Urban master plans at municipal level with CC and gender mainstreamed in Jordan *In line with AF output 2.1: Strengthened capacity of national and regional centres and networks to respond rapidly to extreme weather events Municipal plans developed or modified to respond to new conditions resulting from climate variability and change *In line with AF output 1.1: Risk and vulnerability assessments conducted and updated Municipal inhabitants in target areas are coved by municipal plans with climate change mainstreamed in it, including women and Syrians *In line with AF output 1.2: Targeted population groups covered by	No. of staff trained to respond to, and mitigate impacts of, climate-related events (in line with AF results indicator 2.1.1) through assessment and planning processes (workshops/trainings) Number of staff / people Women participating Youth participating No of municipal plans with climate change mainstreamed into them based on vulnerability data developed or adapted (in line with AF results indicator 1.1) Percentage of municipal inhabitant in target areas covered by the municipal plans Percentage of women, youth and Syrians in target areas covered by the municipal plans	0 0 0 0 0 0	T: 450 W: >45 % Y: >15 % 2 50 % 50 %				

adequate risk reduction systems	Above is in line with AF results framework indicator 1.2.1.)						
Component 2: Increasing the resilience of citizens (DPs and host communities): Improve awareness, ownership and capacities to respond to climate change, incl. to operate, maintain and replicate resilient water harvesting, supply and irrigation systems							
Outcome 2 Strengthened DPs and host community awareness and ownership of climate change adaptation measures + capacities strengthened to operate, maintain and replicate proposed adaptation measures, including skills building *In line with AF outcome 3: Strengthened awareness and ownership of adaptation and climate risk reduction processes at local level *In line with AF outcome 8: support the development and diffusion of innovative adaptation practices, tools and technologies	Percentage of targeted direct population aware climate change and appropriate responses to climate change (in line with AF results indicator 3.1) Women aware Youth aware % of targeted direct population with skills enhanced using acquired climate information and knowledge to undertake, operate, maintain and replicate proposed adaptation measures Innovative adaptation practices / technologies encouraged to be replicated and upscaled through replication plans (in line with AF results indicator 8)	0 0 0 0 0	W: >40 % Y: >15 % 30 % 50 % 8 (including gender consideration)	Assumption: proposed adaptation measures have an impact at the district/municipal level Assumption: DPs and host communities including women and youth are available and interested to increase awareness about and replicate proposed climate adaptation measures Assumption: DPs and host communities are sensible to messages about climate-related risks and adaptation to climate change Engagement of target direct population in awareness raising activities and O & M plans development	Surveys: use scale from 1 to 5 to summarize findings of analysis Replication and upscaling plans Count the number of replication and upscaling plans produced and gender consideration	Baseline, mid-term and end	UN-H in cooperation with EE and government
Output 2.1. Community organisation, awareness and capacity building + operation, maintenance and replication and upscaling plans for concrete adaptation output 3.1: Rooftop rainwater harvesting in Lebanon *In line with AF Output 3.2: strengthened capacity of	No. of tools and guidelines developed and shared with relevant stakeholders (in line with AF results indicator 3.2.2) Number O & M plans produced and shared Number of replication guidelines produced and shared	0 0	~~20~~ 10 1	Ensure criteria of O & M plans and replication guidelines are clear and that 'sharing' of plans is measured	O & M plans produced and shared within the target bulding management and users	Baseline, mid-term and end	UN-H in cooperation with EE and government

national and subnational stakeholders and entities to capture and disseminate knowledge and learning (also applies to below outputs)							
Output 2.2. Community organisation, awareness and capacity building + operation, maintenance and replication and upscaling plans for concrete adaptation output 3.2: Rooftop rainwater harvesting in Jordan	No. of tools and guidelines developed and shared with relevant stakeholders (in line with AF results indicator 3.2.2) Number O & M plans produced and shared Number of replication guidelines produced and shared	0 0	64~~86~~ 1				
Output 2.3. Community organisation, awareness and capacity building + operation, maintenance and replication and upscaling plans for concrete adaptation output 3.3: Greywater treatment and reuse in Jordan	No. of tools and guidelines developed and shared with relevant stakeholders (in line with AF results indicator 3.2.2) Number O & M plans produced and shared Number of replication guidelines produced and shared	0 0	40 1				
Output 2.4. Community organisation, awareness and capacity building + operation, maintenance and replication and upscaling plans for concrete adaptation output 3.4: Efficient treatment and reuse of wastewater,	No. of tools and guidelines developed and shared with relevant stakeholders (in line with AF results indicator 3.2.2) Number O & M plans produced and shared Number of replication guidelines produced and shared	0 0	1 (for Zahle, to irrigate 800 ha of land) 1				

Commented [JD8]: Please not that 64 is the updated number of rainwater harvesting units that will be installed by JOHUD instead of the initial 84.

Output 2.5. Community organisation, awareness and capacity building + operation, maintenance and replication and upscaling plans for concrete adaptation output 3.5: Efficient treatment and reuse of wastewater in Jordan	No. of tools and guidelines developed and shared with relevant stakeholders (in line with AF results indicator 3.2.2) Number O & M plans produced and shared Number of replication guidelines produced and shared	0 0	3 (for WWTPs) 1				
Output 2.6 Community organisation, awareness and capacity building + operation, maintenance and replication and upscaling plans for concrete adaptation output 3.6 Water-use-efficient irrigation of treated wastewater in Lebanon	No. of tools and guidelines developed and shared with relevant stakeholders (in line with AF results indicator 3.2.2) Number O & M plans produced and shared Number of replication guidelines produced and shared	0 0	1 (~~150~~ 800 ha farmland) 1				
Output 2.7. Community organisation, awareness and capacity building + operation, maintenance and replication and upscaling plans for concrete adaptation output 3.7: Water-use-efficient irrigation of treated wastewater in Lebanon	No. of tools and guidelines developed and shared with relevant stakeholders (in line with AF results indicator 3.2.2) Number O & M plans produced and shared Number of replication guidelines produced and shared	0 0	1 (for 195~~220~~ dunum farmland) 1				
Output 2.8. Community organisation, awareness and capacity building + operation, maintenance and replication and upscaling plans for concrete adaptation output 3.8: permaculture demonstration	- **No. of tools and guidelines developed and shared with relevant stakeholders (in line with AF results indicator 3.2.2)** - Number O & M plans produced and shared - Number of replication guidelines produced and shared	0	1	Calculate number of students which completed the curriculum	Certificates and / or plans developed by students	Baseline, mid-term and end	UN-H in cooperation with EE and government

Commented [JD9]: For output 2.7.1 that will be conducted by JOHUD, they did not change anything on this output

	- ~~—~~**No. of students completed permaculture curriculum with certificate (** - ~~—~~**No. of students completed permaculture curriculum with ~~verificate~~certificate (** - **Students with certificate)** -	0 0 0	1 1 T: 200 W: >50 %				
Output 2.9. Community organisation, awareness and capacity building + operation, maintenance and replication and upscaling plans for concrete adaptation output 3.8: permaculture demonstration	- **No. of tools and guidelines developed and shared with relevant stakeholders (in line with AF results indicator 3.2.2)** - **Number O & M plans produced and shared** - **Number of replication guidelines produced and shared** - **No. of students completed permaculture curriculum with certificate (Students with certificates)** ~~Students with certificate~~ - **Women**	0 0 0 0	1 1 1 T: 270 W: >50 %	Calculate number of students which completed the curriculum	Certificates and / or plans developed by students	Baseline, mid-term and end	UN-H in cooperation with EE and government
Component 3: Increasing the adaptive capacity of the water sector: Expand unconventional water harvesting, supply and irrigation options, using innovative and replicable techniques suitable for the context							
Outcome 3 Increased adaptive capacity within relevant development and natural resource sectors and *In Line with AF outcome 4: Increased adaptive capacity within relevant development and natural	See outputs Ha of farmland with more sustained climate-resilient livelihoods – see outputs	See outputs					

resource sectors and *In Line with AF outcome6: Diversified and strengthened livelihoods and sources of income for vulnerable people in targeted areas *In line with AF outcome 8: support the development and diffusion of innovative adaptation practices, tools and technologies	Innovative techniques / interventions – see outputs						
Output 3.1. Rooftop rainwater harvesting in Lebanon *In line with AF output 4: Vulnerable physical, natural, and social assets strengthened in response to climate change impacts, including variability *In line with AF output 8: Viable innovations are rolled-out scaled up, encouraged and / or accelerated	Number of RWH systems installed Volume of rainwater collected and stored to supply safe and clean freshwater during dry periods	0	~~20~~10	System must be functional, effective and satisfactory of users	Photos of systems Assess effectiveness (water harvested) and satisfactory through measurements and surveys	Baseline, mid-term and end	UN-H in cooperation with EE and government
Output 3.2. Rooftop rainwater harvesting in Jordan *In line with AF output 4: Vulnerable physical, natural, and social assets strengthened in response to climate change impacts, including variability *In line with AF output 8: Viable innovations are rolled-out scaled up, encouraged and / or accelerated	Number of RWH systems installed Volume of rainwater collected and stored to supply safe and clean freshwater during dry periods	0	64 RWH systems will be installed~~86 (of which 18 rehabilitated)~~				
Output 3.3. Greywater treatment and reuse in Jordan *In line with AF Output 4: Vulnerable physical,	Number of GWTR systems installed	0	40				

natural, and social assets strengthened in response to climate change impacts, including variability *In line with AF output 8: Viable innovations are rolled-out scaled up, encouraged and / or accelerated							
Output 3.4. Efficient treatment and reuse of wastewater in Lebanon *In line with AF output 4: Vulnerable physical, natural, and social assets strengthened in response to climate change impacts, including variability *In line with AF output 8: Viable innovations are rolled-out scaled up, encouraged and / or accelerated	~~Irrigation channels (1x1 meters with 0.25m thick walls) constructed (in meters)~~One reservoir Two pumping lines to two zones ~~18000~~ 20,000 m^3 water flow through ~~channel~~ pumping lines from Zahle WWTP	0 Baseline quality	1 (10,000 m^3) ~~3000~~ 9300 meters (3,300 m to Zone A and 5,500 m to Zone B) Compliant to standard ~~18000~~ 20,000 m^3	~~Channel~~ Pumping lines must be able to support ~~18000~~ 20,000 m^3 and comply to standards	Quantity and quality of water and ~~channel~~ Map of storage and conveying system / coordinates and photos Identify any visual construction weaknesses Map / coordinates and photos Quantity and quality treated		
Output 3.5. Efficient treatment and reuse of wastewater in Jordan *In line with AF output 4: Vulnerable physical, natural, and social assets strengthened in response to climate change impacts, including variability *In line with AF output 8: Viable innovations are rolled-out scaled up, encouraged and / or accelerated	Water storage constructed / installed Water quality	0 Baseline quality	1x~~3000~~ 2000 m^3 (Maerad WWTP) 1x500~~2000~~ m^3 (AlAkaider WWTP) Compliant to standard	Storage must be irrigatable and quality compliant to standards	Quantity and quality water and storage tanks - map / coordinates and photos		

~~**Output 3.6.**~~ ~~Water use efficient irrigation of treated wastewater in Lebanon~~ ~~*In line with AF output 4: Vulnerable physical, natural, and social assets strengthened in response to climate change impacts, including variability~~ ~~*In Line with AF output6 No and type of adaptation assets created or strengthened in support of individual or community livelihood strategies~~ ~~*In line with AF output 8: Viable innovations are rolled-out scaled up, encouraged and / or accelerated~~	~~Treated and channelled water from Zahle WWTP irrigating farmland (ha) and thus sustaining climate resilience of agriculture livelihoods~~	~~0~~	~~150 ha~~	Calculate ha of farmlands being irrigated by treated wastewater	~~Map / coordinates and photos~~		
Output 3.7 Water-use-efficient irrigation of treated wastewater in Jordan *In line with AF output 4: Vulnerable physical, natural, and social assets strengthened in response to climate change impacts, including variability *In Line with AF output6 No and type of adaptation assets created or strengthened in support of individual or community livelihood strategies *In line with AF output 8: Viable innovations are rolled-out scaled up, encouraged and / or accelerated	Conveyor irrigation pipeline 6' size installed (in meters) Treated and stored channeled water from **Maered** WWTP irrigating farmland (ha) and thus sustaining climate-resilience of agriculture livelihoods Treated and stored channeled water from **Al Kaider** WWTP irrigating farmland (ha) and thus sustaining climate-resilience of agriculture livelihoods Treated and channeled water from **Mafraq** WWTP irrigating farmland (ha) and thus sustaining	0 0 0 0	4000m 60 dunum 60 dunum 75~~100~~ dunum				

	climate-resilience of agriculture livelihoods Treated and channeled water from small ponds and thus sustaining climate-resilience of agriculture livelihoods	0	8 ponds	Calculate number of ponds			
Output 3.8 Permaculture demonstration *In line with AF output 4: Vulnerable physical, natural, and social assets strengthened in response to climate change impacts, including variability *In line with AF output 8: Viable innovations are rolled-out scaled up, encouraged and / or accelerated	~~**Permaculture demonstration site established, including:**~~ - Biofertilizer site - ~~Crop garden and compost egg laying chickens (30 chickens)~~Organic crop garden - Olive trees (Orchard monoculture conversion to Food Forest) - Compost Chicken system with egg production ~~Beehives~~ ~~Compost sub-od worm farms~~	0 0 ~~0~~ ~~0~~ 1,000 m2 of monoculture olives~~0~~ ~~0~~ 0	 ~~1~~ ~~1 Biofertilizer~~ 1,000 m2 of organic soil fertilizer production 1,000 m2 of diverse organic crop garden in full production ~~1~~ ~~30 chickens~~ 1,000 m2 of organic mix food forest majoring in olives ~~3 flow hives~~ ~~Beehives (one Flowhive (from Australia and two locally manufactured)~~ 30 chickens producing compost~~1~~	Calculate numbers Assess effectiveness of reducing water use	Map / coordinates and photos Assess reduction water use (soil moist)		

	~~Olive trees (Orchard Monoculture Conversion to Food Forest)~~		~~sub-od worm farms~~ ~~1000 m2~~				
Output 3.9. Permaculture demonstration *In line with AF output 4: Vulnerable physical, natural, and social assets strengthened in response to climate change impacts, including variability *In line with AF output 8: Viable innovations are rolled-out scaled up, encouraged and / or accelerated	Permaculture demonstration site established, including: - Agricultural Waste Management for Sustainable Crop Production - Urban, Peri-Urban and Rural Agriculture and Water Harvesting as Adaptation Measures - Apiculture and the reduction of chemical substance use at farm level - Introducing adapted crop varieties and diversifying farm production	0 0 0 0	30 20 80 10	Calculate numbers Assess effectiveness of reducing water use	Map / coordinates and photos Assess reduction water use (soil moist)		
Component 4: Improving knowledge and policies and regulations to increase urban resilience in the region: Project KM and replication, incl. development of regional urban risks and vulnerabilities management model in the context of climate change and urban (population) growth (incl. from DPs migration)							
Outcome 4. Strengthened (inter)National institutional capacity to manage climate change and DP crisis related urban water scarcity challenges, including lessons learned collected and shared regionally *In line with AF outcome 3: Strengthened awareness and ownership of adaptation and climate risk reduction processes at local level	Strengthened capacity of national and subnational stakeholders and entities to capture and disseminate knowledge and learning (in line with AF results indicator 3.2) % increased of gender-sensitive good practices /lessons learnt per country at national and city level that are shared	0 0	50 % 30 %	Assumptions: Countries are keen to share experience and learn from each other's	Content of the good practices disseminated and shared Survey to assess awareness of the good practices shared	Baseline, mid-term and end	UN-Habitat
Output 4.1. Regional / international KM with focus on sharing	Number of technical committees formed to ensure transfer of			Assumption: countries are keen to be part of the CoP,	Content of the good practices disseminated and shared	Baseline, mid-	UN-Habitat

project lessons and replication *In line with AF Output 3.2: strengthened capacity of national and subnational stakeholders and entities to capture and disseminate knowledge and learning	knowledge (in line with AF results indicator 3.2.1.) Regional steering committee formed National steering committees formed Number of tools and guidelines developed and shared with relevant stakeholders through the CoP (in line with AF results indicator 3.2.2). Project video developed and shared with relevant stakeholders No of good practices per city shared Number of regional workshops held	0 0 0 0 0 0	1 5 4 2 1 5	learn from each other and share good practices Risk: organizational and bureaucratic delays in organizing regional workshops Risk: weak interaction between the CoP members Risk: Political factors might limit the engagement of some countries and cities Risk: delay in documenting and sharing good practices among the countries and receiving feedback Risk: lack of interest/ support/participation in field visits by countries Risk: limited participation of women in field visits Risk: logistic delays in organizing field visits by countries	Survey to assess awareness of the good practices shared Agenda, minutes and photos of meetings and workshops. Video online Content of new/revised municipal plans Field visits reports and agenda Field visits feedback reports	term and end	
Output 4.2. Jordan and Lebanon KM with focus on project progress, best practices and lessons learned *In line with AF Output 3.2: strengthened capacity of national and subnational stakeholders and entities to capture and disseminate knowledge and learning	Nr. of municipal plans on gender sensitive climate adaptation that have been developed/revised (for incorporating the good practices) Nr. of bilateral city-to-city meetings held among Jordan and Lebanon on gender sensitive climate adaptation practices No. of field visits conducted and lessons learned shared No. of field visits exchanged with a focus on gender and climate change No. of participants to the visits (gender disaggregated	0 0 0 0	8 (6 in Lebanon and 2 in Jordan) At least 6 exchange in both countries 4 20 (50 % Women)				
Output 4.3. Sub-national KM and Regional' urban risks and vulnerabilities assessment, planning and management	Number of tools and guidelines developed and shared with relevant stakeholders (in line with AF results indicator 3.2.2).			Assumption: Steering committee members will share knowledge through international events including	Online and presented Presentation + audience type and number in events	4th year	UN-H in cooperation with EE and

approach model for type 2 cities *In line with AF Output 3.2: strengthened capacity of national and subnational stakeholders and entities to capture and disseminate knowledge and learning	Regional' urban risks and vulnerabilities assessment, planning and management approach model developed and shared No of views of the online modules Presentations of the model given / shared at events and webinars % increased interest in applying the model in other cities/countries % increased awareness of the content of the module	0 0 0 0 0	1 (with gender consideration) 500 5 30 % 30 %	planning approach, best practices, etc. Risk: lack of interest in online modules and webinar Risk: logistics issues limiting accessibility to the modules and webinars	Online feedback for the modules and webinar from the participants Content of the model shared		governm ent
Output 4.4. Incentive mechanism (financial) and regulatory framework to replicate and upscale rainwater harvesting activities *In line with AF Output 3.2: strengthened capacity of national and subnational stakeholders and entities to capture and disseminate knowledge and learning	Number of tools and guidelines developed and shared with relevant stakeholders (in line with AF results indicator 3.2.2). Incentive mechanism (financial) and regulatory framework to replicate and upscale rainwater harvesting activities developed/published and shared % increased interest in replicating upscale rainwater harvesting in other cities in Jordan	0 o	1 30 %	With a focus on Jordan			

Table 27: Indicative Core Indicator Targets

Impact-level results	Core indicator	Disaggregated data and targets	Comment
Increased adaptive capacity of communities to respond to the impacts of climate change	Number of beneficiaries (direct) Component 1 ~~and 2~~	Total: 930 Women:>40 % Youth: >15 %	Direct beneficiary numbers in overview table 6 include all project activities, while those in the results framworks focus on specific activities such as O & M. Indirect beneficiaries, see also project overview table 6
	Number of beneficiaries (direct) Component ~~3~~2	Total:~~101,588~~147,774 Women: 69% Youth: 34 % Syrian: 41 %	
	Number of beneficiaries (direct) Component 43	Total: ~~157,309~~158,563 Women: 69% Youth: 33 % Syrian: 42 %	
	Number of beneficiaries (direct) Component ~~5~~4	T: 600 W:>40 % Y: >15 %	
	Assets produced, developed, improved, or strengthened RWH systems GWRT systems ~~3km irrigation channel~~Reservoir and 9.3 km pumping line Zahle WWTP treated water irrigated through ~~channel~~ storage reservoir and pumping line Water storage constructed / installed Modern / water efficient irrigations systems Permaculture demonstration site	~~10~~674 40 1 (10,000 m3) 1 (~~18000~~ 20,000 m3 of water) 1 (60,000 m3 with 6000 m3 water flow 2 (1x2000 m and 1x3000 m3) ~~5~~ 4 (one covering 150 ha; one covering 40 ha; 2 covering 60 dunum; 1 covering 100 dunum	All 'concrete' adaptation activities are designed to increase climate change-related water scarcity resilience
	Increased income, or avoided decrease in income	See ha of farmland being more water stress resilient, thus sustaining resilient agriculture livelihoods	The 'concrete' adaptation activities related to the WWTPs and irrigation interventions are designed to support increased resilience of the agriculture livelihoods

Methodology to apply: https://www.adaptation-fund.org/wp-content/uploads/2016/04/AF-Core-Indicator-Methodologies.pdf

F. Project alignment with the Adaptation Fund results framework

Table 28 Project alignment with the Adaptation Fund results framework

Project Outcome	Project Outcome Indicator	Fund Outcome	Fund Outcome Indicator	Grant Amount (USD)
Outcome 1 Strengthened municipal institutional capacity to manage climate change and DP crisis related urban water scarcity challenges by mainstreaming these aspects into spatial strategies + developing action / investment plans and guidelines (with identified solutions) to use water most efficiently within municipal boundaries Reduced exposure to climate-related hazards and threats at the municipal level	No and type of targeted institutions with strategies / guidelines and urban master plans with climate change and gender mainstreamed. Number of strategies / guidelines (district-national level) Number of urban master plans in Lebanon Number of urban master plans in Jordan Relevant threat and hazard information generated and disseminated through to stakeholders on a timely basis (in line with AF results indicator 1) Municipal plans with climate change mainstreamed in it disseminated during project	**Outcome 2:** Strengthened institutional capacity to reduce risks associated with climate-induced socioeconomic and environmental losses **Outcome 1** Reduced exposure to climate-related hazards and threats	2.1. Capacity of staff to respond to, and mitigate impacts of, climate-related events from targeted institutions increased 1. Relevant threat and hazard information generated and disseminated to stakeholders on a timely basis	1,341,000
Outcome 2 Strengthened DPs and host community awareness and ownership of CC adaptation measures + capacities strengthened to operate, maintain and replicate proposed adaptation measures	Percentage of targeted direct population aware of adaptation measures being implemented Women participating Youth participating	**Outcome 3:** Strengthened awareness and ownership of adaptation and climate risk reduction processes at local level	3.1. Percentage of targeted population aware of predicted adverse impacts of climate change, and of appropriate responses	1,8 7681,6711,9 18,787.36
	Technologies replication and upscaling plans	**Outcome 8:** support the development and diffusion of innovative adaptation practices, tools and technologies	8. Innovations adaptation practices are rolled-out, scaled up, encouraged and / or accelerated at regional, national and / or subnational level	
Outcome 3 Increased adaptive capacity within the water sector through resilient and sustainable water harvesting, supply and irrigation options, using innovative and replicable techniques suitable for the	See outputs	**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 4.2. Physical infrastructure improved to withstand climate change and variability-induced stress	7,306509.52 17,514,7677 677,472,650.64

context and benefitting vulnerable groups	See outputs	**Outcome 6:** Diversified and strengthened livelihoods and sources of income for vulnerable people in targeted areas	6.1 Percentage of households and communities having more secure (increased) access to livelihood assets 6.2. Percentage of targeted population with sustained climate-resilient livelihoods	
Outcome 4 Strengthened (inter)National institutional capacity to manage climate change and DP crisis related urban water scarcity challenges, including lessons learned collected and shared regionally	Strengthened capacity of national and subnational stakeholders and entities to capture and disseminate knowledge and learning (in line with AF results indicator 3.2) % increased of gender-sensitive good practices /lessons learnt per country at national and city level that are shared	**Outcome 3:** Strengthened awareness and ownership of adaptation and climate risk reduction processes at local level	3.1. Percentage of targeted population aware of predicted adverse impacts of climate change, and of appropriate responses	923,162
	Technologies replication and upscaling plans	**Outcome 8:** support the development and diffusion of innovative adaptation practices, tools and technologies	8. Innovations adaptation practices are rolled-out, scaled up, encouraged and / or accelerated at regional, national and / or subnational level	
Project Output	**Project Output Indicator**	**Fund Output**	**Fund Output Indicator**	**Grant Amount (USD)**
Output 1.1 Territorial planning and development strategy / guidelines with CC and gender mainstreamed in Lebanon	No of municipal plans with climate change mainstreamed into them based on vulnerability data developed or adapted Percentage of municipal inhabitant in target areas covered by the municipal plans Percentage of women, youth and Syrians in target areas covered by the municipal plans No. of staff and population directly involved in assessment and planning processes through workshops/trainings Number of staff / people Women participating Youth participating	**Output 1.1** Risk and vulnerability assessments conducted and updated **Output 1.2.** Targeted population groups covered by adequate risk reduction systems **Output 2.1**: Strengthened capacity of national and regional centres and networks to respond rapidly to extreme weather events	1.1. No. of projects/programmes that conduct and update risk and vulnerability assessments (by sector and scale) 1.2.1. Percentage of target population covered by adequate risk-reduction systems 2.1.1. No. of staff trained to respond to, and mitigate impacts of, climate-related events	249,000
Output 1.2. Urban master plans developed or modified at municipal level with CC and gender mainstreamed (respond to new conditions resulting from climate variability and change) in Lebanon				530,000
Output 1.3. Urban master plans developed or modified at municipal level with CC and gender mainstreamed (respond to new conditions resulting from climate variability and change)in Jordan				562,000

Outputs 2.1, 2.2, 2.3, 2.4, 2.5, 2.6, 2.7, 2.8, 2.9 Strengthened DPs and host community awareness and ownership of climate change adaptation measures + capacities strengthened to operate, maintain and replicate proposed adaptation measures	No. of O & M plans and staff and population directly involved with development of these plans Total staff / population: Women participating Youth participating No. of students completed permaculture curriculum Total students Women	**Output 3.2** Strengthened capacity of national and subnational stakeholders and entities to capture and disseminate knowledge and learning	3.2.2 No of tools and guidelines developed and shared with relevant stakeholders	~~500,000~~ ~~Approx - see details in budget notes)~~1,876,671
Output 3.1. Rooftop rainwater harvesting in Lebanon	Number of RWH systems installed	**Output 4:** Vulnerable physical, natural, and social assets strengthened in response to climate change impacts, including variability **Output 6:** Targeted individual and community livelihood strategies strengthened in relation to climate change impacts, including variability **Output 8**: Viable innovations are rolled-out scaled up, encouraged and / or accelerated	4.1.2. No. of physical assets strengthened or constructed to withstand conditions resulting from climate variability and change 6.1. No and type of adaptation assets created or strengthened in support of individual or community livelihood strategies 8.1 No of innovative adaptation practices, tools and technologies accelerated, scaled-up and / or replicated	~~7,509,767~~30 ~~6,521~~7,514,767~~7,472,650~~
Output 3.2. Rooftop rainwater harvesting in Jordan	Number of RWH systems installed			
Output 3.3. Greywater treatment and reuse in Jordan	Number of GWTR systems installed			
Output 3.4. Efficient treatment and reuse of wastewater in Lebanon	~~Irrigation channels (1x1 meters with 0.25m thick walls) constructed (in meters)~~Storage reservoir (10,000 m^3) 9,300 m of pumping lines ~~18000~~ 20,000 m^3 treated wastewater flow through ~~channel~~ pumping lines from Zahle WWTP			
Output 3.5. Efficient treatment and reuse of wastewater in Jordan	Water storage constructed / installed Water quality			
~~**Output 3.6.** Water-use-efficient irrigation of treated wastewater in Lebanon~~	~~Treated and channelled water from Zahle WWTP irrigating farmland (ha) and thus sustaining climate-resilience of agriculture livelihoods;~~			
Output 3.7 Water-use-efficient irrigation of treated wastewater in Jordan	Conveyor irrigation pipeline 6' size installed (in meters) Treated and stored channelled water from Maered WWTP irrigating farmland (ha) and thus sustaining climate-resilience of agriculture livelihoods; Treated and stored channelled water from Al Kaider WWTP irrigating farmland (ha) and thus sustaining climate-resilience of agriculture livelihoods; Treated and channelled water from Mafraq WWTP irrigating farmland (ha) and thus sustaining climate-resilience of agriculture livelihoods			

Commented [JD10]: Newly added budget total for component 2 instead of the approximation that was previously written as 500,000

	Treated and channelled water from small ponds and thus sustaining climate-resilience of agriculture livelihoods			
Output 3.8. Permaculture demonstration	Permaculture demonstration site established, including: Biofertilizer site ~~Crop garden and compost egg~~Organic Crop Garden Olive trees (Orchard monoculture conversion to food forest) ~~laying chickens (30 chickens)~~ Compost chicken system with egg production~~Beehives~~ ~~Compost sub-od worm farms~~ ~~Olive trees (Orchard Monoculture Conversion to Food Forest)~~			
Output 3.9 Permaculture demonstration	Permaculture demonstration site established, including: - Agricultural Waste Management for Sustainable Crop Production - Urban, Peri-Urban and Rural Agriculture and Water Harvesting as Adaptation Measures - Apiculture and the reduction of chemical substance use at farm level - Introducing adapted crop varieties and diversifying farm production			
Output 4.1. Regional / international KM with focus on sharing project lessons and replication	Number of technical committees formed to ensure transfer of knowledge (in line with AF results indicator 3.2.1.) Regional steering committee formed National steering committees formed Number of tools and guidelines developed and shared with relevant stakeholders through the CoP (in line with AF results indicator 3.2.2). Project video developed and shared with relevant stakeholders Nb of good practices per city shared Number of regional workshops held	**Output 3.2** Strengthened capacity of national and subnational stakeholders and entities to capture and disseminate knowledge and learning **Output 8**: Viable innovations are rolled-out scaled up, encouraged and / or accelerated	3.2.2 No of tools and guidelines developed and shared with relevant stakeholders 8.1 No of innovative adaptation practices, tools and technologies accelerated, scaled-up and / or replicated	923,162
Output 4.2. Jordan and Lebanon KM with focus on project progress, best practices and lessons learned	Nr. of municipal plans on gender sensitive climate adaptation that have been developed/revised (for incorporating the good practices) Nr. of bilateral city-to-city meetings held among Jordan and Lebanon on gender sensitive climate adaptation practices No. of field visits conducted and lessons learned shared			

	No. of field visits exchanged with a focus on gender and climate change No. of participants to the visits (gender disaggregated			
Output 4.3. Sub-national KM and Regional' urban risks and vulnerabilities assessment, planning and management approach model for type 2 cities	Number of tools and guidelines developed and shared with relevant stakeholders (in line with AF results indicator 3.2.2). Regional' urban risks and vulnerabilities assessment, planning and management approach model developed and shared Nb of views of the online modules Presentations of the model given / shared at events and webinars % increased interest in applying the model in other cities/countries % increased awareness of the content of the module			
Output 4.4. Incentive mechanism (financial) and regulatory framework to replicate and upscale rainwater harvesting activities	Number of tools and guidelines developed and shared with relevant stakeholders (in line with AF results indicator 3.2.2). Incentive mechanism (financial) and regulatory framework to replicate and upscale rainwater harvesting activities developed/published and shared % increased interest in replicating upscale rainwater harvesting in other cities in Jordan			

G. Detailed budget

Table 29 Detailed Budget. For all budget notes, see annex 6

Project Components	Expected Concrete Outputs	Expected Concrete Outcomes	TOTAL	Year 1 12 m	Year 2 12 m	Year 3 12 m	Year 4 12 m
Component 1 Manage urban risks and vulnerabilities in the context of climate change, esp. water scarcity challenges, and urban (population) growth, including DPs migration trends	**Output 1.1.** Territorial planning and development strategy / guidelines with CC and gender mainstreamed in Lebanon	Outcome 1.1 Strengthen municipal institutional capacity to manage climate change and DP crisis related urban water scarcity challenges by mainstreaming these aspects into spatial strategies + developing action / investment plans and guidelines (with identified solutions) to use water most efficiently within municipal boundaries	249,000	249,000	-	-	-
	Output 1.2. Urban master plans at municipal level with CC and gender mainstreamed in Lebanon		530,000	260,000	241,000	17,000	12,000
	Output 1.3. Urban master plans at municipal level with CC and gender mainstreamed in Jordan		562,000	267,000	237,000	34,000	24,000
	TOTAL		**1,341,000**	776,000	478,000	51,000	36,000
Component 2 Improve awareness, ownership and capacities to respond to climate change impacts, incl, to operate, maintain and replicate resilient water harvesting, supply and irrigation systems	**Output 2.1.** Community organisation, awareness and capacity building + operation, maintenance and replication and upscaling plans for concrete adaptation output 3.1	Outcome 2.1 Strengthened DPs and host communities awareness and ownership of CC adaptation measures + capacities strengthened to operate and maintain proposed adaptation measures, including skills building	195,400	36,700	51,750	54,750	52,200
	Output 2.2. See above for output 3.2.		139,200	31,200	43,500	46,500	18,000
	Output 2.3. See above for output 3.3.		234,000	36,000	82,000	82,000	34,000
	Output 2.4. See above for output 3.4.		1763,200	761,300	29,900	56,850	15,150
	Output 2.5. See above for output 3.5.		16,000	-	-	6,000	10,000
	Output 2.6. See above for output 3.6.		127742,100	391,6150	268,6150	558,6150	146,1650
	Output 2.7. See above for output 3.7.		259,000	90,400	83,800	32,400	52,400
	Output 2.8. See above for output 3.8.		314,600 ~~351,716.36~~	113,000 ~~107505~~	66,200 ~~80404~~	65,200 ~~79404~~	70,200 ~~84404~~
	Output 2.9. See above for output 3.9.		418,171	123,157	125,457	117,457	52,100
	TOTAL		~~**1,881,6711,876,671**~~ ~~**1,918,787.36**~~	530,907533,407 ~~525,412~~	510,757509,257 ~~524,961~~	519,307516,807 ~~533,511~~	320,700318,200 ~~334,904~~
Component 3 Expand climate change resilient (unconventional) water harvesting and supply options, using innovative, low-cost and replicable techniques	**Output 3.1**. Rooftop rainwater harvesting in Lebanon	Outcome 3.1 Increased adaptive capacity within the water sector through resilient and sustainable water harvesting, supply and irrigation options, using innovative and cost-effective techniques suitable for the context and replicable and benefitting vulnerable groups	~~867,262~~460,776	~~11,364~~11,314	~~400,767~~197,574	~~443,767~~240,574	~~11,364~~11,314
	Output 3.2. Rooftop rainwater harvesting in Jordan		836,820	5,000	471,410	355,410	5,000
	Output 3.3. Greywater treatment and reuse in Jordan		843,112	11,364	410,192	410,192	11,364
	Output 3.4. Efficient treatment and reuse of wastewater, incl in Lebanon		~~846,120~~ 2,246,556	~~16,224~~ 53,724	~~829,896~~ 2,192,832	-	-
	Output 3.5. Efficient treatment and reuse of wastewater in Jordan		1,~~053,332053~~2, 332607	-	1,053,332~~1,053,332~~	-	-

	~~**Output 3.6.** Water-use-efficient irrigation of treated wastewater in Lebanon~~		~~988,950~~	~~6,600~~	~~497,775~~	~~484,575~~	
	Output 3.7. Water-use Efficient irrigation of treated wastewater in Jordan		804,400	10,800	780,400	6,600	6,600
	Output 3.8. Permaculture demonstration - closed loop water system in Jordan		384,046 ~~346,929.64~~	~~214,001~~200,591 ~~171,762~~	~~57,756~~61,009 ~~58,389~~	6~~57,756~~1,434 ~~58,389~~	~~57,762~~61,012 ~~58,389~~
	Output 3.9. Permaculture demonstration – closed loop water system in Lebanon		885,725	307,080	236,975	187,710	153,960
	TOTAL		~~7,472,650.64~~7,514,767	~~540,194~~598,110	~~4,739,136~~5,404,311	~~1,946,643~~1,262,507	~~246,677~~
Component 4 Project Knowledge management and replication and development of regional urban risks and vulnerabilities management approach model	**Output 4.1**. Regional / international KM with focus on sharing project lessons and replication	Outcome 4.1 Strengthened (inter)National institutional capacity to manage climate change and DP crisis related urban water scarcity challenges, including lessons learned collected and shared regionally	280,000	45,000	35,000	95,000	
	Output 4.2. Jordan and Lebanon KM with focus on project progress, best practices and lessons learned		437,800	110,620	105,280	96,180	125,720
	Output 4.3. Sub-national KM and Regional' urban risks and vulnerabilities assessment, planning and management approach model for type 2 cities		165,000	-	68,000	20,000	77,000
	Output 4.4. Incentive mechanism (financial) and regulatory framework to replicate and upscale rainwater harvesting activities		40,362	-	-	36,000	4,362
	TOTAL		**923,162**	155,620	208,280	247,180	312,082
Sub-total Project Components Costs			**11,655,600**	2,0~~64,899~~41,~~248~~	~~6,598,261~~5,~~935,703~~	2,076,907~~763,660~~	9
Project Execution Costs	Regional Project coordination		264,000	66,000	66,000	66,000	
	National Project execution		827,400	227,100	218,100	191,100	1
	Travel Related to Execution		37,810	10,543	8,362	8,362	
	Operations		69,000	15,000	15,000	15,000	24,000
	Terminal evaluation		25,000	-	-	-	25,000
Sub-total Project Execution Costs		9.50%	**1,223,210**	318,643	307,462	280,462	316,643
SUB-TOTAL Component + execution fee			**12,878,810**	2,~~359,891~~383,542	6,~~243,165~~905,723	~~3,044,122~~2,357,369	1,~~231,632~~232,175
Project Cycle Management Fee	UN-H ROAS Project Support Costs: AF and UN-H policies compliance Progress / evaluation Travel	1.50%	193,182	35,~~399~~753	~~93,648~~103,586	~~45,661~~35,361	18,~~474~~ 483
	UN-H HQ Project Support Costs: Overall project supervision, incl. compliance to UN-H policies and standards (gender, human rights, climate change, etc.)	7.00%	901,517	~~165,192~~166,848	~~437,022~~483,401	~~213,089~~165,016	86,~~214~~ 252
Sub-total Project Cycle Management Fee		8.50%	**1,094,699**	~~200,591~~202,601	~~530,670~~586,986	~~258,750~~200,376	104,735~~688~~
Amount of Financing Requested			**13,973,509**	**2,~~560~~586,~~482~~143**	**~~6,773,835~~7,492,709**	**~~3,302,872~~2,557,745**	**1,336,910~~320~~**

Commented [JD11]: This is the newly added total of the outputs above (added manually). Although on the excel file it shows that the total is 7,479,767

Commented [JD12]: The newly added total has an increase of 1,000 USD which is traced to output 2.6 total (128,100 which was initially 127,100 but after adding the yearly budget for output 2.6 the number was 128,100)

For an overview of milestones, see annex 7

Table 30: M & E budget

M&E								
Type of M & E Activity	**Activity**	**Entity**	**Row**	**Total**	**1**	**2**	**3**	**4**
Measurements of means of verification (baseline assessment and M & E plans) as part of inception	Workshop	UN-ESCWA		**20,000**	20,000			
	Reports preparation and EE compliance to AF ESP and GP	UN-H ROAS		**29,499**	29,499			
Direct Project Monitoring and Quality Assurance including annual progress and financial reporting, project revisions, technical assistance and ESP and GP compliance (from execution fee M & E and safeguards)	M & E UN-H offices	UN-H National offices		**100,800**	25,200	25,200	25,200	25,200
Overall project monitoring and evaluation (from cycle management fee)		UN-H ROAS		**32,197**	5,900	15,608	7,610	3,079
Audits	In line with AF requirements	OIOS		**-**	-	-	-	-
Terminal external evaluation		Independent		**25,000**				25,000
Total				**207,496**	**80,598**	**40,808**	**32,810**	**53,279**
From Project Execution fee				100,800	25,200	25,200	25,200	25,200
From Project Cycle Management fee				61,696	35,398	15,608	7,610	3,079

H. Disbursement schedule

Table 31 Disbursement schedule

	Year 1	Year 2	Year 3	Year 4
Schedule	1st disbursement –	2nd disbursement – One Year after project inception	3rd disbursement - Two years after project inception	4th disbursement – Three years after project inception
Milestones	Milestones Upon agreement signature	Milestones (by end of year): Upon First Annual Report Upon financial report indicating disbursement of at least 70% of funds of 1st year	Milestones (by end of year) Upon Second Annual Report Upon financial report indicating disbursement of at least 70% of funds of 2nd year	Milestones (by end of year) Upon Third Annual Report Upon financial report indicating disbursement of at least 70% of funds of 3rd year

Schedule date	**Upon Signing**	One Year after project inception	Two years after project inception	Three years after project inception
A. Project Funds (US$)	2,041,2482,041,248	6,621,9125,935,703	2,076,9072,763,660	915,532914,989
B. Programme Execution (US$)	318,643318,643	307,462307,462	280,462280,462	316,643316,643
C. Programme Cycle Mgt (US$)	200,591200,591	588,998530,670	200,376258,750	104,735104,688
Sub-total (US$)	519,234519,234	896,460838,132	480,838539,212	421,378421,331
TOTAL (US$)	**2,560,482** **2,560,482**	**7,518,372** **6,773,835**	**2,557,745** **3,302,872**	**1,336,910** **1,336,320**

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

A. Record of endorsement on behalf of the government[105]

Saleh Al-Kharabsheh Minister, Ministry of Environment, Jordan	Date*: January 22, 2020*
Fadi Jreissati, *Minister, Ministry of Environment, Lebanon*	Date*: January 20, 2020*

Ministry of Environment

Ref.No 7-2-776
Date 22-1-2020

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

Subject: Endorsement for **"Increasing the resilience of both displaced persons and host communities to climate change-related water challenges in Jordan and Lebanon".**

In my capacity as designated authority for the Adaptation Fund in Jordan, I confirm that the above regional project/programme proposal is in accordance with the government's national and regional priorities in implementing adaptation activities to reduce adverse impacts of, and risks, posed by climate change in Jordan. The project aligns specifically with Jordan's climate change policy and Intended Nationally Determined Contributions (INDC). The regional approach shall also improve management of water challenges and pressure on resources regionally and foster our cooperation with Lebanon, including under the Regional Refugee and Resilience Plan 2020- 2021.

Also, the Ministry of Environment reviewed and approved the Environmental and Social Impact Assessment and the Environmental Risk Management and Monitoring Plan that was submitted by UN-Habitat as part of this project.

Accordingly, I am pleased to endorse the above project/programme proposal with support from the Adaptation Fund. If approved, the project/programme will be implemented by UN-Habitat and executed in Jordan by the mentioned entities in the proposal document.

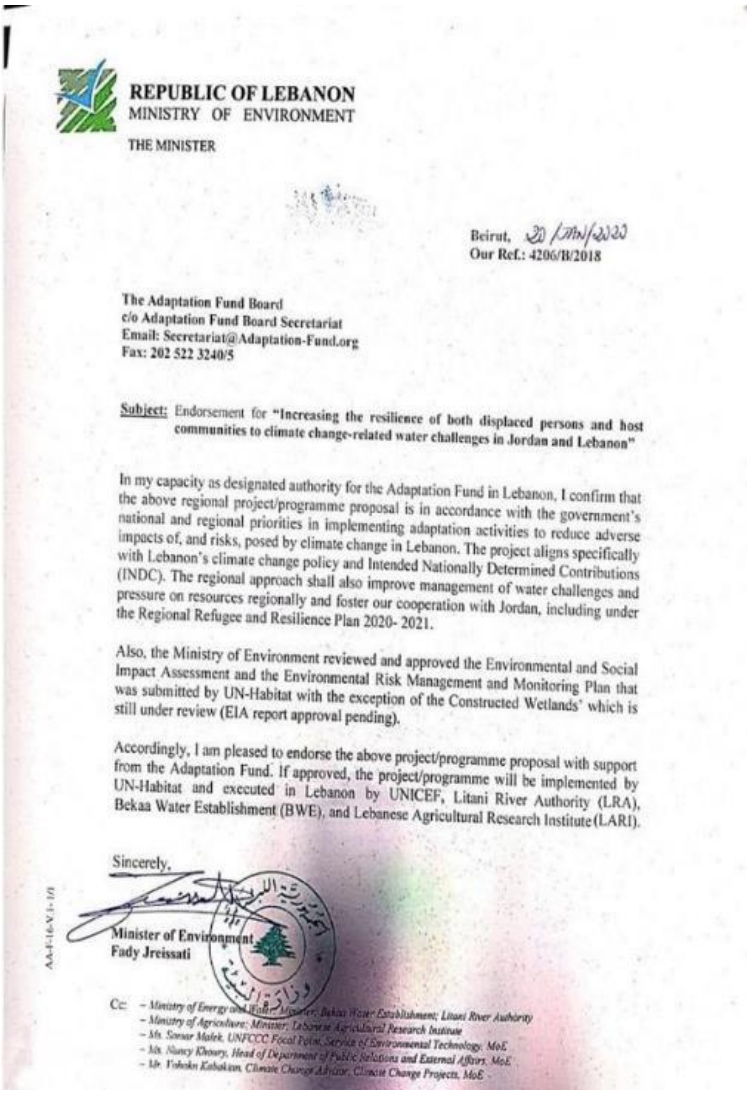
Sincerely,

Minister of Environment

Dr. Saleh Al-Kharabsheh

The Hashemite Kingdom Of Jordan
Tel : +962 6 5560113 Fax : +962 6 5516377 P.O.Box : 1408 Amman 11941 Jordan www.moenv.gov.jo

[105] Each Party shall designate and communicate to the secretariat the authority that will endorse on behalf of the national government the projects and programmes proposed by the implementing entities.



REPUBLIC OF LEBANON
MINISTRY OF ENVIRONMENT
THE MINISTER

Beirut, 20/May/2020
Our Ref.: 4206/B/2018

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

Subject: Endorsement for **"Increasing the resilience of both displaced persons and host communities to climate change-related water challenges in Jordan and Lebanon"**

In my capacity as designated authority for the Adaptation Fund in Lebanon, I confirm that the above regional project/programme proposal is in accordance with the government's national and regional priorities in implementing adaptation activities to reduce adverse impacts of, and risks, posed by climate change in Lebanon. The project aligns specifically with Lebanon's climate change policy and Intended Nationally Determined Contributions (INDC). The regional approach shall also improve management of water challenges and pressure on resources regionally and foster our cooperation with Jordan, including under the Regional Refugee and Resilience Plan 2020- 2021.

Also, the Ministry of Environment reviewed and approved the Environmental and Social Impact Assessment and the Environmental Risk Management and Monitoring Plan that was submitted by UN-Habitat with the exception of the Constructed Wetlands' which is still under review (EIA report approval pending).

Accordingly, I am pleased to endorse the above project/programme proposal with support from the Adaptation Fund. If approved, the project/programme will be implemented by UN-Habitat and executed in Lebanon by UNICEF, Litani River Authority (LRA), Bekaa Water Establishment (BWE), and Lebanese Agricultural Research Institute (LARI).

Sincerely,

Minister of Environment
Fady Jreissati

Cc: - *Ministry of Energy and Water; Minister; Bekaa Water Establishment; Litani River Authority*
- *Ministry of Agriculture; Minister; Lebanese Agricultural Research Institute*
- *Ms. Sonsar Malek, UNFCCC Focal Point, Service of Environmental Technology, MoE*
- *Ms. Nancy Khoury, Head of Department of Public Relations and External Affairs, MoE*
- *Dr. Yohoko Kobakian, Climate Change Advisor, Climate Change Projects, MoE*

AA-F-16-V3-1/1

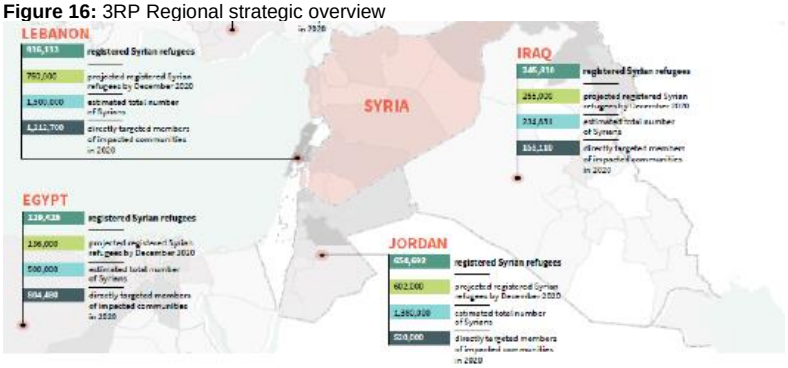
B. Implementing Entity certification

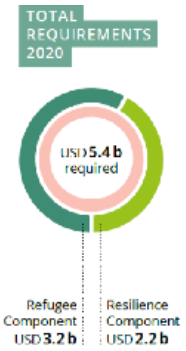
Development and Adaptation Plans in Jordan and
, including INDC, NAP, TNCs and the regional 3RP,
o the approval by the Adaptation Fund Board, comm
nting the project/programme in compliance with the
nental and Social Policy of the Adaptation Fund and
nding that the Implementing Entity will be fully (legall
y) responsible for the implementation of this
rogramme.

ANNEX 1: Refugee crisis statistics and project alignment with 3RP (regional refugee and resilience plan)[106] and climate change scenarios and vulnerabilities in project target areas.

Below figures show a need for funding for increasing the resilience of DPs / refugees, including for the WASH sector, which will be impacted by climate change, especially in Jordan and Lebanon. It also show the current numbers of refugees registered, those between 2013-2020 and the geographical location (which shows most are in the project target locations).

Figure 16: 3RP Regional strategic overview



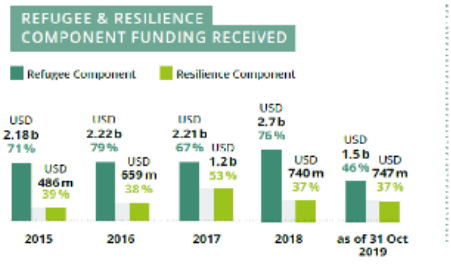


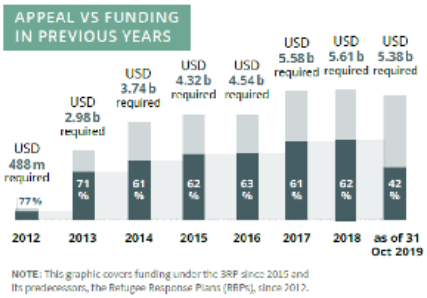
FINANCIAL REQUIREMENTS

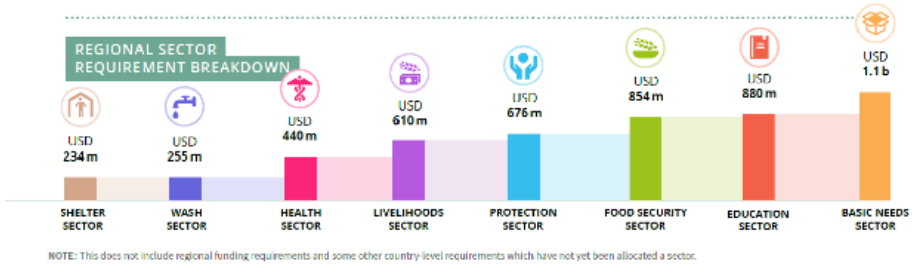
COUNTRY	Refugee Component (USD)	Resilience Component (USD)	Total Requirements 2020 (USD)	Estimated Total Needs 2021 (USD)
TURKEY	554,009,139	620,919,147	1,174,928,285	973,000,000
LEBANON	1,363,938,455	1,310,450,672	2,674,389,127	TBC
JORDAN	913,505,965	161,989,717	1,075,495,682	TBC
IRAQ	173,209,275	86,733,027	259,942,303	241,023,436
EGYPT	121,851,102	32,312,103	154,163,205	166,983,477
REGIONAL	92,970,742	3,000,000	95,970,742	TBC
TOTAL	3,219,992,177	2,214,897,167	5,434,889,344	TBC

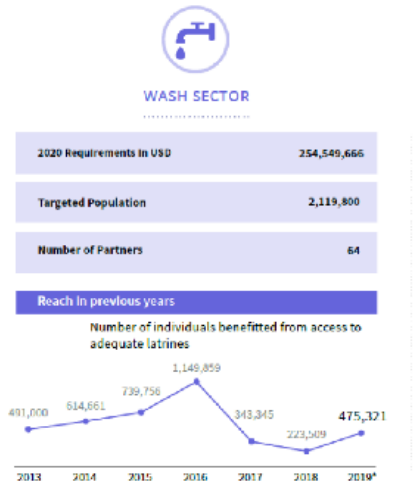
NOTE: All figures subject to change pending finalization/ release/launch of the 3RP country chapters. Jordan figures are pending review by the Government of Jordan and therefore may be subject to change in due course. The total requirements 2020 figure does not include the appeal requirements of the government in Jordan (1bn) or Lebanon (1 bn).

[106] https://data2.unhcr.org/en/documents/download/67370


REFUGEE & RESILIENCE COMPONENT FUNDING RECEIVED
Refugee Component
Resilience Component
USD 2.18 b 71 %
USD 486 m 39 %
USD 2.22 b 79 %
USD 559 m 38 %
USD 2.21 b 67 %
USD 1.2 b 53 %
USD 2.7 b 76 %
USD 740 m 37 %
USD 1.5 b 46 %
USD 747 m 37 %
2015
2016
2017
2018
as of 31 Oct 2019
NOTE: The percentages of component funded against component requirements.

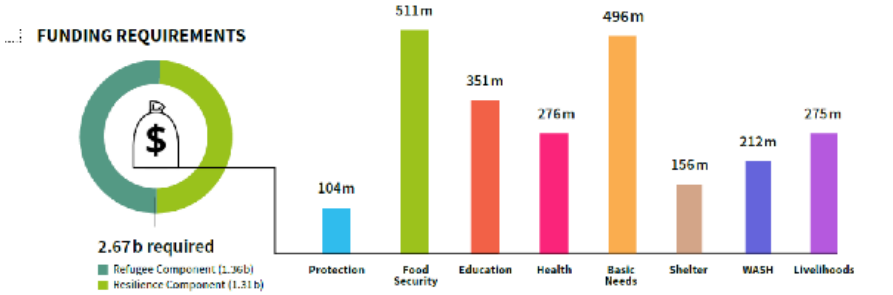

APPEAL VS FUNDING IN PREVIOUS YEARS
USD 488 m required
77 %
USD 2.98 b required
71 %
USD 3.74 b required
61 %
USD 4.32 b required
62 %
USD 4.54 b required
63 %
USD 5.58 b required
61 %
USD 5.61 b required
62 %
USD 5.38 b required
42 %
2012
2013
2014
2015
2016
2017
2018
as of 31 Oct 2019
NOTE: This graphic covers funding under the 3RP since 2015 and its predecessors, the Refugee Response Plans (RRPs), since 2012.


REGIONAL SECTOR REQUIREMENT BREAKDOWN
USD 234 m
USD 255 m
USD 440 m
USD 610 m
USD 676 m
USD 854 m
USD 880 m
USD 1.1 b
SHELTER SECTOR
WASH SECTOR
HEALTH SECTOR
LIVELIHOODS SECTOR
PROTECTION SECTOR
FOOD SECURITY SECTOR
EDUCATION SECTOR
BASIC NEEDS SECTOR
NOTE: This does not include regional funding requirements and some other country-level requirements which have not yet been allocated a sector.

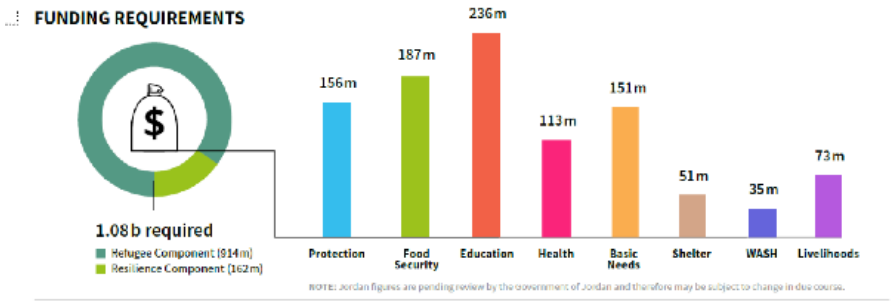

WASH SECTOR
2020 Requirements in USD 254,549,666
Targeted Population 2,119,800
Number of Partners 64
Reach in previous years
Number of individuals benefitted from access to adequate latrines
491,000
614,661
739,756
1,149,859
343,345
223,509
475,321
2013
2014
2015
2016
2017
2018
2019*


LIVELIHOODS & SOCIAL COHESION SECTOR
2020 Requirements in USD 610,276,633
Targeted Population 850,200
Number of Partners 211
Reach in previous years
Number of individuals assisted to access wage employment opportunities
10,802
20,154
29,561
30,337
32,370
93,036
2013
2014
2015
2016
2017
2018
2019*

LEBANON



JORDAN

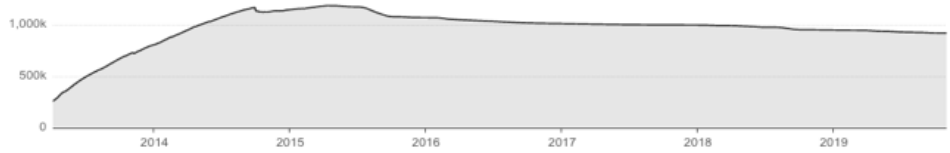


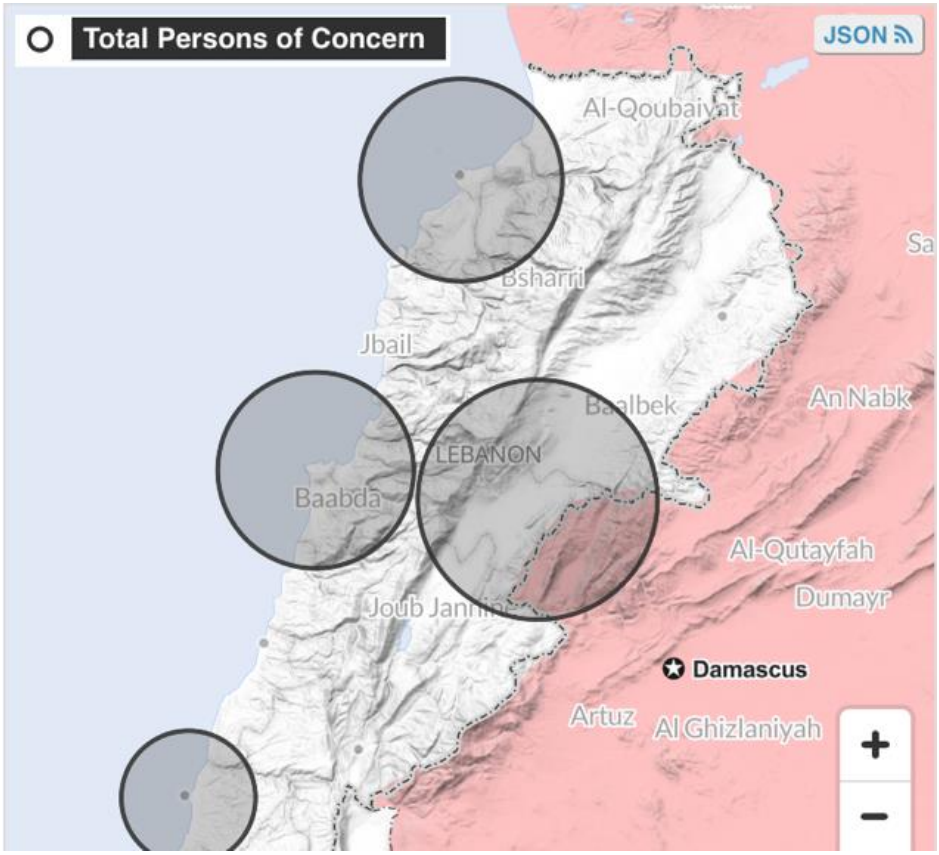
DPs in Lebanon[107]

Total Persons of Concern: 918,974

Location name	Source	Data date	Population	
Bekaa	UNHCR	31 Oct 2019	37.3%	342,875
North Lebanon	UNHCR	31 Oct 2019	26.5%	243,125
Beirut	UNHCR	31 Oct 2019	24.8%	228,009
South Lebanon	UNHCR	31 Oct 2019	11.4%	104,965

Registered





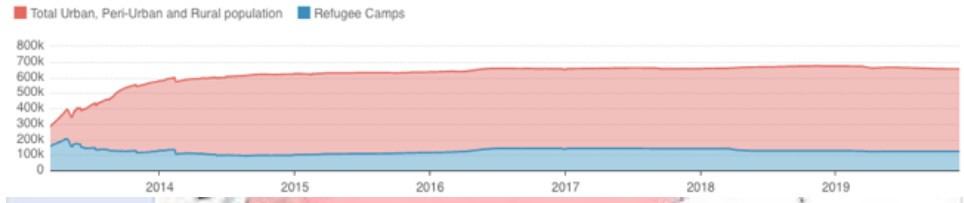
[107] https://data2.unhcr.org/en/situations/syria/location/71#_ga=2.248854471.1978193527.1540994637-1966626473.1540994637

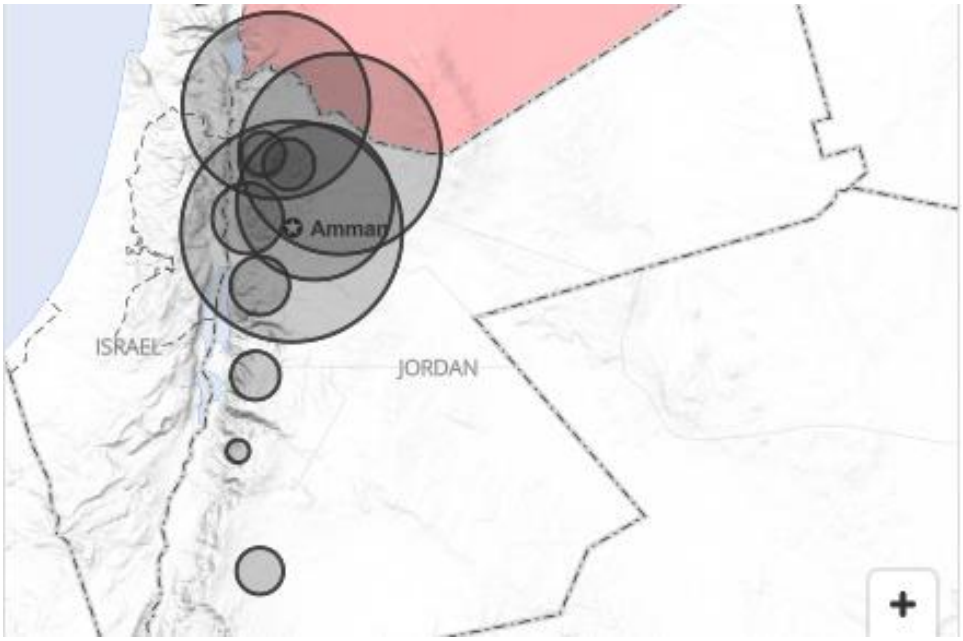
DPs in Jordan[108]

Total Persons of Concern : 654,192

Location name	Source	Data date	Population	
Amman Governorate	UNHCR	1 Dec 2019	29.5%	192,667
Mafraq Governorate	UNHCR	1 Dec 2019	24.8%	161,933
Irbid Governorate	UNHCR	1 Dec 2019	20.6%	134,585
Zarqa Governorate	UNHCR	1 Dec 2019	14.5%	94,619
Balqa Governorate	UNHCR	1 Dec 2019	2.8%	18,446
Madaba Governorate	UNHCR	1 Dec 2019	2.0%	13,096
Jarash Governorate	UNHCR	1 Dec 2019	1.4%	9,301
Karak Govenorate	UNHCR	1 Dec 2019	1.3%	8,526
Maan Governorate	UNHCR	1 Dec 2019	1.3%	8,376
Ajlun Governorate	UNHCR	1 Dec 2019	1.0%	6,590
Aqaba Governorate	UNHCR	1 Dec 2019	0.6%	3,621
Tafilah Govenorate	UNHCR	1 Dec 2019	0.3%	1,738

Refugees from Syria by date .CSV .JSON





[108] https://data2.unhcr.org/en/situations/syria/location/36#_ga=2.22371195.1978193527.1540994637-1966626473.1540994637

Jordan climate change scenarios and vulnerabilities in project target area

Multiple climate scenario modelling and vulnerability assessment studies have been conducted for Jordan in the last 10 years. Additional to the "formal" climate scenario modelling and vulnerability assessment study conducted as part of the latest Third National Communication Report of Jordan to UNFCCC (2014)[109], which simulated general or country-wide level of climate scenario modelling and vulnerability assessment and will be used here for general-level remarks, there are two more site-specific climate modelling studies, which are considered almost directly (Wade et al. 2010[110]) and 100% directly (Hammouri et al. 2016[111]/Hammouri 2009[112]) representative studies to the locations of the interventions of this proposal.

(1) THIRD NATIONAL COMMUNICATION (TNC) REPORT'S (2014) CLIMATE SCENARIO MODELING AND VULNERABILITY ASSESSMENT

According to the TNC (2014) climate scenario modelling and vulnerability assessment, and based on long historical data obtained from Jordan Metrology Department (JMD), climatic variables at all over the country are changing significantly at both national and station level, indicating that climate change is becoming more apparent. Both the Mann-Kendall rank trend test and linear regression trends indicate that the annual precipitation tends to decrease significantly with time at a rate of 1.2 mm per year. In addition, the historic data tested in both annual and monthly basis indicated that precipitation reduction is highly significant during the whole rainy season except for January. Similarly, during the dry seasons of June, July and August, the precipitation has tended to increase over time, although this increase is considered negligible in its quantity as indicated by the magnitude of the slope. Interpolated spatial maps shows the locations of these changes to be more apparent at both northern and southern parts. Simultaneously, the mean, maximum and minimum air temperature tends to increase significantly by 0.02, 0.01, and 0.03 °C/year, respectively.

Dynamic downscaling for this study was achieved using Africa CORDEX domain, in which 43 grid points with 50 km resolution were crossed throughout the country. Nine different GCM coupled with two RCMs for two RCPs (4.5 and 8.5) were used to assess future projections as compared to reference historic data (1980-2010). Three time horizons were selected; 2020-2050, 2040-2070, and 2070-2100.

The projections' results totally agree with previous work of Second National Communication (SNC[113]) to UNFCCC and are consistent with IPCC-AR5. For the year 2085, the two RCPs extremely likely predicted rise in mean temperature for all of the country, up +2.1°C [+1.7 to +3.1°C] for RCP 4.5, and +4°C [3.8-5.1°C] for RCP 8. The increase was predicted to be homogeneous for the RCP 4.5, and stronger for the Eastern and the Southern regions for RCP 8.5. Future dynamic projections predict extremely likely warmer summer compared to other seasons.

Compared to the SNC that used CMIP3 results, multiensemble projections of CMIP5 results coupled with regional climate models in CORDEX give a more consistent trend to a likely drier climate. In 2070-2100, the cumulated precipitation could likely decrease by 15% [-6% to -25%] in RCP 4.5, by – 21% [-9% to -35%] in RCP 8.5. The decrease would be more marked in the western part of the country.
It is more likely to have drier autumn and winter as compared to spring, with a median value of precipitation decrease reaching -35% in autumn in 2070-2100.

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[109] Third National Communication Report of Jordan to UNFCCC (2014), UNDP and Jordan Ministry of Environment.

[110] Wade, A., Black, E., Brayshaw, D., El-Bastawesy, M., Holmes, P., Butterfield, D., Nuimat, S., and Jamjoum, K. 2010, 'A model-based assessment of the effects of projected climate change on the water resources of Jordan', Philosophical Transactions of the Royal Society A, 368, 5151–5172.

[111] Nezar Hammouri, Jan Adamowski, Muwaffaq Freiwan, Shiv Prasher (2016) Climate change impacts on surface water resources in arid and semi-arid regions: a case study in northern Jordan, Acta Geod Geophys DOI 10.1007/s40328-016-0163-7. Online first: 19 Feb 2016. (https://eis.hu.edu.jo/deanshipfiles/pub10367100124.pdf)

[112] Nezar Hammouri (2009), International Conference and Exhibition on Green Energy & Sustainability for Arid Regions & Mediterranean Countries, Le Royal Hotel Amman, Jordan November, 10-12 2009 https://www.weap21.org/Downloads/ClimateChangeImpactsJordan.pdf

[113] Second National Communication (SNC) to UNFCCC (2009). UNDP and Jordan Ministry of Environment.

Also, the dynamic projections predict more extremely likely heat waves where the analysis of summer temperature, monthly values and the inter-annual variability reveal that some thresholds could be exceeded especially for a summer month where the average of maximum temperature for the whole country could exceed 42-44°C.

Drought events were likely predicted as indicated by the two indices of consecutive dry days and SPI. The maximum number of consecutive dry days would likely increase in the reference model of more than 30 days for the 2070-2100. Potential evaporation would also likely increase.

Based on the outcomes of the climate scenario modelling and vulnerability assessment conducted for the TNC, climate exposure, risks, sensitivity, impacts were assessed and adaptive measures were introduced.

For the Water Sector in particular, results revealed that based on the climate trends analysis using CORDEX and RCP 4.5 and 8.5 the main climate hazards that the water sector faces in Jordan are temperature increases, increased incidents of drought, increased evaporation, and precipitation decreases. Climate sensitivity indicators in water sector were determined as reduced groundwater recharge, groundwater quality deterioration, stream flow reduction and increased water demand.

Assessment of sensitivity showed that the average sensitivity level is 3.71. Adaptation strategies and measures suggested for the water sector in the TNC are:

- Rainwater harvesting
- Wastewater treatment
- Desalination
- Increasing Efficiency of irrigation technologies
- Grey water Reuse
- Public awareness

It is obvious that 5 out of the 7 adaptation measures advanced to water sector in Jordan are covered in this proposal.

(2) WADE EL AL. (2010) CLIMATE SCENARIO MODELING AND VULNERABILITY ASSESSMENT

This study was concerned with the quantification of the likely effect of anthropogenic climate change on the water resources of Jordan (one case study from the Northern part and one from the Southwestern part) by the end of the twenty-first century (2100). The study has two parts. In the first part, the effects of daily and seasonal precipitation patterns on streamflow in the upper River Jordan are explored using climate scenarios as inputs to the modelling framework. In the second part, the same methodology is applied to a site in southwestern Jordan, the Wadi Faynan, which is considered representative of the wadis draining to the lower Jordan, although the Wadi Faynan itself drains to the Dead Sea in the south rather than the Jordan River. Considered together, these two components provide insight into the mechanisms by which the projected changes in precipitation and near-surface air temperature will affect the hydrological cycle in semi-arid environments.

Specifically, a suite of hydrological models were used in conjunction with modelled outcomes from a regional climate model, HadRM3, and a weather generator to determine how future flows in the upper River Jordan, which forms the north-western boundary of the Yarmouk Water basin where the two intervention sites of this proposal (Irbid and Mafraq) are located. Climate projections were extracted from HadRM3 RCM simulations of the 1961–1990 control and the 2071–2100 future periods. The hydrological components of the model framework are the Pitman rainfall–run-off model and the Integrated Catchments model (INCA v. 1.11.10). The Pitman model is a conceptual, process-based model of the rainfall–run-off relationship.

The results indicate that groundwater will play an important role in the water security of the country as irrigation demands increase. Given future projections of reduced winter rainfall under the A2 scenario for the 2071–2100 period, which is predicted to be for the upper Jordan for the largest monthly reductions around 30% during December and January and increased near-surface air temperatures, the already low groundwater recharge will decrease further. Simulations of the said study projected no increase in flood magnitude in the upper River Jordan. The reduction in winter rainfall can be related to changes in the largescale circulation and is predicted by most climate models (e.g. Kitoh et al. 2008; Evans 2009;

Hemming et al. 2010; Jin et al. 2010), the same cannot be said for the spring precipitation, which leads to large uncertainties in the prediction of rain in this season (Black et al. in press). At the peak of the rainy season, the number of rainy days is projected to decrease, reflecting reductions in both the PRR and the PDR, of approx. 25 per cent (PRR reduced from approx. 0.6 to 0.4–0.5 and PDR reduced from approximately 0.2 to 0.15). The overall picture is, therefore, of a longer rainy season with a less pronounced peak, with the mean annual rainfall decreasing in the headwaters of the River Jordan and the Wadi Faynan. The reduction in rainfall is accompanied by an increase in mean annual temperature by 2°C and hence potential evaporation increases.

As a result of the reduced winter rainfall, and this indicates that flood magnitudes will be reduced. Increases in the flow extremes, in terms of flood magnitude and occurrence, are not evident, which is consistent with Black (2009), who found no significant changes in rainfall intensity in these projections
for this region. Discussions in the said paper presents results of other interesting modelling studies and focuses on the implications of reduced water availability in Jordan. For example, the said paper highlights that the reduction in the mean annual rainfall and the increase in near-surface air temperatures suggest that irrigation requirements will increase, worsening the water shortage in the region. This suggestion is supported by preliminary applications of the CROPWAT model in the Water, Life and Civilisation study and by applications of a soil–vegetation–atmosphere transfer (SVAT) model TRAIN, which indicate increases in evapotranspiration and water demand (Menzel et al. 2009). The preliminary predictions of the CROPWAT model suggest that, at Ramtha in northwest Jordan, the irrigation demand will increase from 62 to 132mm of water when growing vegetables under the A2 scenario for 2071–2100 using HadRM3 and an assumed irrigation efficiency of 70 per cent. The TRAIN model provides an overview of the Jordan Valley region, and the modelled outcomes suggest a 6 per cent increase in the water demand for agriculture over the entire region and up to a 50 per cent decrease in water availability in northwest Jordan (HadCM3, A1B scenario, 2021–2050 compared with 1961–1990 control period). An overall increase in local and regional irrigation demand has serious implications for Jordan since further stress will be put on the groundwater resource.

(3) HAMMOURI EL AL (2009 & 2016) CLIMATE SCENARIO MODELING AND VULNERABILITY ASSESSMENTS

The most relevant and recent study conducted for the northern part of Jordan per se, where the activities of this project are located, is the recent study conducted by a group of national and international (Canadian) researchers, meteorology and climate experts published in 2016[114]. In the said study, lead by the deeply involved in climate modelling in Jordan, Professor Nezar Hammouri from Hashemite University, the Soil and Water Assessment Tool (SWAT), a watershed scale model developed by the USDA Agricultural Research Service (ARS), was used to assess climate scenarios, vulnerability and potential impacts of climate change on water resources in the northern regions of Jordan, Yarmouk Basin under different future climate scenarios. Yarmouk Water Basin, which spans the northern part of Jordan and southern part of western Syria and emptying into the Jordan River (Figure A), is the major surface water basin in Jordan where Irbid and Mafraq regions are located-Figure A, and Jerash (or Jarash) is only few kilometres to the south laying in another water basin named Amman Zarqa Basin, Figure B, which was assessed in another study by the same researcher[115]. In the said studies, Global Climate Models (GCMs) were used to assess the future impacts of climate change on water resources in the three study areas. To study potential impacts of climate change on hydrological system and water resources, two river basins have been selected in the territory of Jordan: the Amman- Zarqa River and the Yarmouk River Baasin. To simulate potential changes in runoff, the WEAP hydrological model has been applied with three selected global circulation models (GCM) which are HADGEM1, CSIROMK3 and ECHAM5OM scenarios.
The Amman-Zarqa River Basin (AZRB) (Figure B) is the second main tributary to River Jordan after Yarmouk River, and thus one of the most significant basins in the country with respect to its economical, social and agricultural importance.

[114] Nezar Hammouri, Jan Adamowski, Muwaffaq Freiwan, Shiv Prasher (2016) Climate change impacts on surface water resources in arid and semi-arid regions: a case study in northern Jordan, Acta Geod Geophys DOI 10.1007/s40328-016-0163-7. Online first: 19 Feb 2016. (https://eis.hu.edu.jo/deanshipfiles/pub10367100124.pdf)

[115] Nezar Hammouri (2009), International Conference and Exhibition on Green Energy & Sustainability for Arid Regions & Mediterranean Countries, Le Royal Hotel Amman, Jordan November, 10-12 2009 https://www.weap21.org/Downloads/ClimateChangeImpactsJordan.pdf

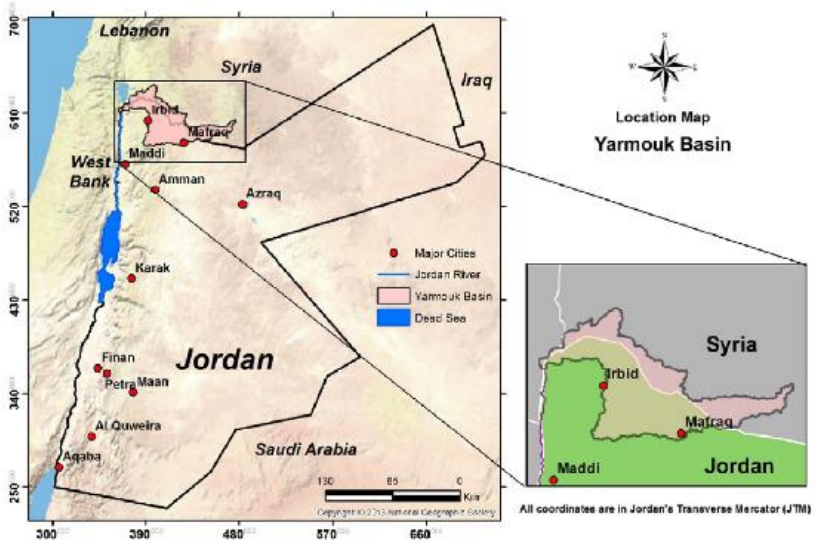


Figure A Geographical location of the Yarmouk River Basin within Jordan where the two (Irbid and Mafraq) of the three sites of this project in Jordan are located.

Figure B Location map of Zarqa Basin (where Jerash intervention site is located) and Yarmouk Basin (where Irbid and Mafraq intervention sites are located) catchment areas.

Yarmouk Basin has the semiarid climate of the Mediterranean Sea region with a limited amount of rainfall and high temperatures. The mean annual rainfall is about 410 mm, while mean annual temperatures is about 18 °C, respectively. About 60 % of the Yarmouk basin's agricultural lands are rainfed, and 20 % are irrigated. Due to over-pumping of groundwater and the construction of dams in Syria's portion of the basin,

the river witnessed a sharp drop in base flow in Jordan's northwest, during the late 1990s and early 2000s. Currently, the summer base flow of this river is about 158 MCM.

In the methodology followed by the above climate scenarios and vulnerability studies, climate, topography, soil and land use data were collected and downloaded to allow the calibration and validation of the GIS-assisted ArcSWAT model based on current conditions in the basin (i.e., baseline scenario). The three Global Climate Model (GCM) models best suited to the study area served to provide separate predicted climate data under different land management options for the ArcSWAT model. The validated SWAT model and using future climatic data provided an assessment of the impacts of climate change on water resources of the study areas. The adopted methodology to achieve the said study's objective is illustrated in Figure C.

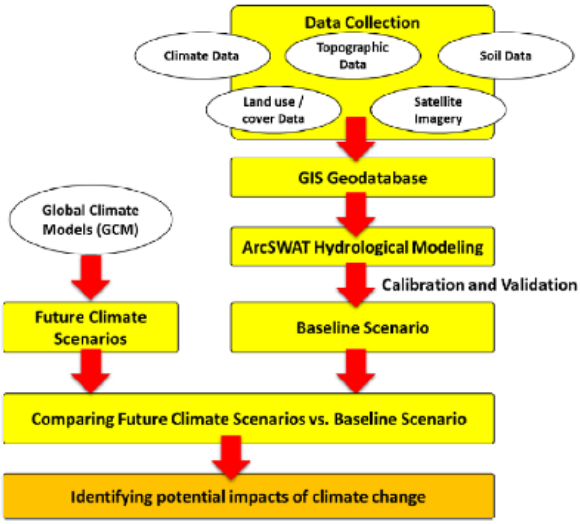


Figure C: Methodology adopted to assess the impacts of climate change in Jordan's Yarmouk River Basin.

Different sets of data were collected (which could be obtained from the researcher), which included:

- Digital Elevation Model (DEM) data
- Soil Data
- Landsat ETM ? Imagery data
- Meteorological Data
- Hydrological modeling using SWAT data (SWAT has been widely used to assess the impacts of climate change on water resources).
- General Circulation Models (GCM) Data for assessment of climate change impacts on water resources

In the said study, two types of future climate data were used:

(1) Incremental scenarios (Figure D)
(2) GCM scenario

Type of Scenario	Precipitation Change	Temperature Increase			
		+ 1°C	+ 2°C	+ 3°C	+ 4°C
Dry Years	-20%	S1	S2	S3	S4
	-10%	S5	S6	S7	S8
Normal Year	No Change	S9	S10	S11	S12
Wet Year	+10%	S13	S14	S15	S16
	+20%	S17	S18	S19	S20

Figure D Incremental scenarios utilized

Future climatic data were used to assess the impacts of climate change on water resources. Two types of future data were used in the said study. The first type of future data is incremental scenarios, where 20 different climatic scenarios were created to represent the dry, normal and wet year conditions. SWAT simulated results for the 20 incremental scenarios are shown in Figure E. The simulation results of these 20 scenarios showed that precipitation is the major factor that affects the vulnerability of surface runoff values. It was also determined that temperature plays a minor role in changes in surface runoff amounts.

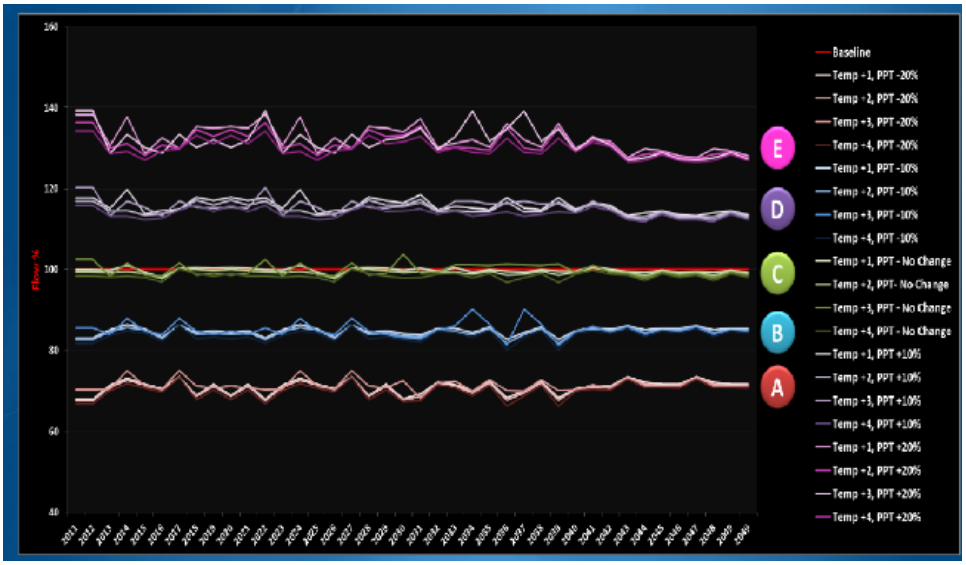


Figure E1 SWAT simulated results for the 20 incremental scenarios

The second type of future climate data used were the Global Climate Model (GCM) scenarios. To assess the impacts of climate change on water resources in the Yarmouk basin, GCMs were used to generate future climate data records. In the said study, temperature and precipitation outputs of 13 GCMs over the period of 1961–2005 were downloaded from the Canadian Climate Change Scenarios Network website (http://www.cccsn.ec.gc.ca/). According to Jordan's Second National Communication to the United Nations Framework Convention on Climate Change (MEJ-UNDP, 2009), there are three GCM models that best match Jordan's climatological records. These include the (i) CSIROMK3 model developed by the Commonwealth Scientific and Industrial Research Organization (CSIRO), Australia, (ii) ECHAM5OM model, the 5th generation of the ECHAM general circulation model developed by the Max Planck Institute for Meteorology, Germany, and (iii) HADGEM1, the Hadley Center Global Climate Model, developed in the UK. For these three models SRES A2 climate models scenarios were used where regional economic development, high population growth and slow technological change are assumed (IPCC 2010). Future climate data from these models were downloaded on daily time scale to cover the period from 2010 to

2060. Daily precipitation, minimum and maximum temperature data from these three models where downscaled using a Statistical Downscaling Model (SDSM), a decision support tool developed to assess local climate change impacts, using a robust statistical downscaling technique (Wilby and Dawson 2004)[116].

Global Climate Models were used in the above-mentioned study to generate future climate records for the 70 year-period (2010–2080) for the Yarmouk basin study area. These data were used as inputs to the calibrated and validated SWAT model to assess the impacts of climate change on water resource of the study area. Each GCM scenario generated one set of stream flow predictions for the Yarmouk basin. Despite using three different GCM climate models, similar results were obtained.

Various magnitudes of decline in surface flow rates were expected in different months. The CSIROMK3 model predicts a major decrease in stream flow rates in February (about 41 %), 37 % in March, 18 % in December and 13 % in January. The net change for rainy months according to this model is 24 % decrease in stream flow rates. For the German model, ECHAM5OM, results similar to those of the CSIROMK3 model were obtained, except for October and November, where the model expect a decrease in stream flow rates with 10 %. The maximum drop is also expected in February (also roughly 40 %). For the entire rainy season, the net flow is projected to drop by 22 %. For the British model, HADGEM1, projected results are more catastrophic. For February, 50 % of the flow rates will decrease. For March, the three GCM models combined predict a drop in stream flow of 30 %. Across the three GCMs maximum drops in the surface flow rates are expected for February and March (45 and 35 % respectively). A minor (\5 %) increase is expected in October and November. The three models projected that the net flow will drop by 22 % for the entire rainy season by the year 2080. This decrease will be particularly severe in the months of maximum peak flow (February and March), perhaps reaching as much as 35–40 %. Therefore, it is crucial to review Jordan's 2008–2022 National Water Strategy and take this into consideration when developing national and local (municipal) plans. Water for **irrigation**, in particular, represents 71 % of the water demand and 64 % of the water supply. According to Jordan's Water Strategy for the years 2008 to 2022 (MoWI 2009), the deficitin the available water resources was approximately 45 % in 2005, while the projecteddeficit in 2022 is expected to be around 30 %. This assumes that additional sources ofwater should be secured and exploited and some mega projects will be implemented. Suchprojects should include rainwater harvesting projects, greywater reuse projects and wastewater treatment for reuse projects. Furthermore, it is indispensable for Jordan to reconsider policies and strategies to assist the country adapt to the impacts of climate change and to reflect on these strategies and policies in the context of Jordan's National Water Strategy.

Based on these results, impacts of climate change are projected to raise **water deficits**in Jordan particularly in the northern part where the influx of refugee has worsen the situation. The considerable amount of data and information available from the climate modelling studies and vulnerability assessments described above will be thus the base for proposed municipality urban master plans at municipal level integrating climate and gender considerations to contribute to increasing resilience of such communities in line with SDG 5 and 13 and in coordination with other initiatives in the region such as the Enabling Communities for Climate Change Adaptation Planning :Understanding Gender Roles. Mainly Targeting SDG 5 and 13.

x

[116]Wilby RL, Dawson CW (2004) Using SDSM Version 3.1 – a decision support tool for the assessment of regional climate change impacts. User Manual. 67 pp. http://unfccc.int/resource/cd_roms/na1/v_and_a/Resoursce_materials/Climate/SDSM/SDSM.Manual.pdf. Viewed 16 Oct 2013

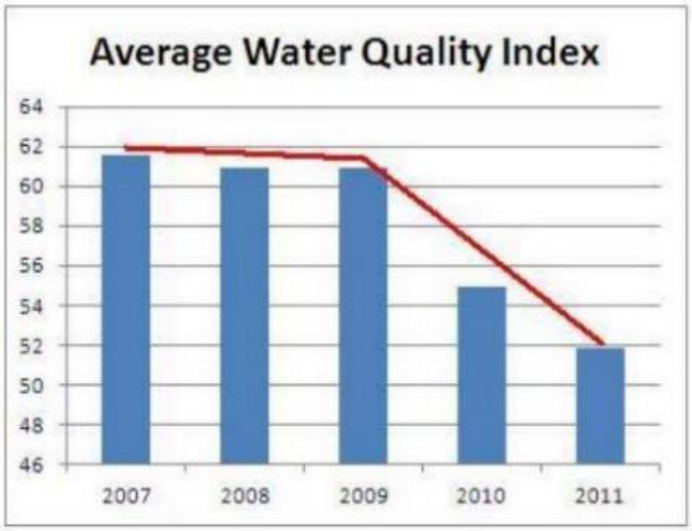
Lebanon climate change scenarios and vulnerabilities in project target area

Water Quantity Issue:
Human pressure on water resources has increased drastically since the 1970s, as confirmed by:

- Significant decrease in river flows, due to increased water withdrawals, through tapping of springs and direct pumping or diversion from the river for irrigation (personal purposes)
- Substantial groundwater depletion, due to extensive pumping both for domestic and irrigation needs.

As stated by National Council for Scientific Research (CNRS), the average annual discharge (mm3) in rivers and springs, namely the Litani River, from 1965 to 2015-17 (over 5 decades) decreased substantially, reaching up to 55%.

Water Quality Issue:
The quality of surface waters in the Litani River Basin varies seasonally and partially but is generally bad. Untreated wastewater discharges, both domestic and industrial, are one of the primary sources of pollution. According to the Litani River Authority (LRA), the average water quality index has been decreasing drastically since 2009.
Poor water quality is a serious public health issue. Water-borne diseases, worldwide, are one of the leading causes of mortality. The occurrence of Dysentery, Typhoid fever and Hepatitis A in the Bekaa is 7.5 annual cases per 10,000 residents, which is twice the national average (2009 statistics from the Ministry of Public Health). These are reported cases only, actual cases could be 5-10 times higher.[117]



Average Water Quality Index (LRA)

Analysis of the state of water-quality deterioration and land degradation in the Litani River Basin (LRB) showed that the main sources of contamination in the basin imply a chaotic urban expansion with resulting loss of arable lands and pressure on water resources in terms of both quantitative and qualitative aspects. Dumping of Analysis of the state of water-quality deterioration and land degradation in the Litani River Basin (LRB) showed that the main sources of contamination in the basin imply a chaotic urban expansion

[117] Retrieved from Nassim Abou Hamad (Head of Water Governance Department at LRA): https://www.pseau.org/outils/ouvrages/office_national_du_litani_climate_change_effect_on_irrigation_2018.pdf (p.9–10, 14)

with resulting loss of arable lands and pressure on water resources in terms of both quantitative and qualitative aspects. Dumping of domestic sewage into streams caused significant bacteriological contamination. A dangerous disposal of liquid and solid waste, including industrial and municipal waste, was observed, which put an increasing pressure on the chemical contamination of surface waters. The LRB represents the most intensive agricultural areas of the country, and thus poor agricultural practices result in the excess use of chemicals and accumulation of nitrates and soluble pollutants in the soil–water ecosystemomestic sewage into streams caused significant bacteriological contamination. A dangerous disposal of liquid and solid waste, including industrial and municipal waste, was observed, which put an increasing pressure on the chemical contamination of surface waters. The LRB represents the most intensive agricultural areas of the country, and thus poor agricultural practices result in the excess use of chemicals and accumulation of nitrates and soluble pollutants in the soil–water ecosystem.[118]

According to climate predictions from the PRECIS model, 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. 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 (MoE, 2011).[119]

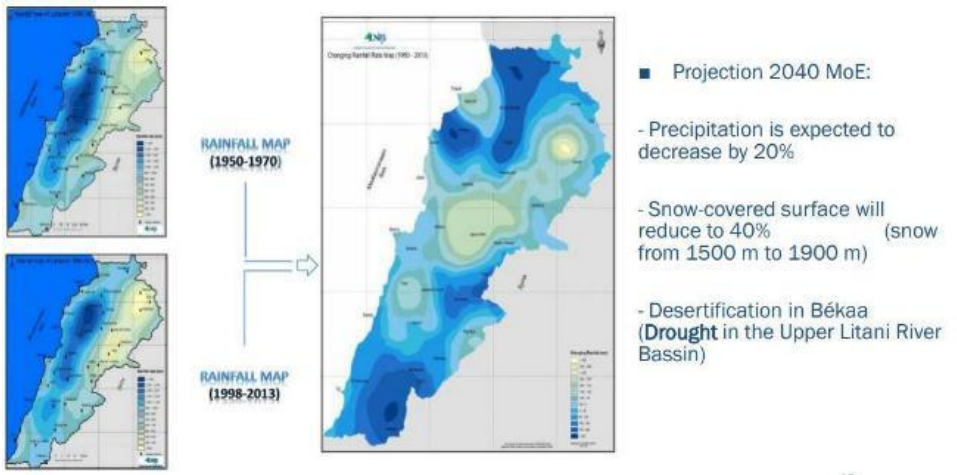
Table 3: Changes in temperature (Tmax, Tmin) and Precipitation (Prcp %) over Beirut, Zahle, Daher and Cedars from the PRECIS model for winter (DJF), spring (MAM), summer (JJA) and autumn (SON), 2025-2044

		Beirut	*Zahle*	*Daher*	*Cedars*
Prcp (%)	DJF	-7,95	-23,50	-0,99	-1,82
	MAM	-8,60	35,50	-0,38	-15,50
	JJA	-26,80	-84,20	-39,00	-49,80
	SON	-8,87	23,80	14,10	12,60
T_{max} (degrees C)	DJF	1,08	1,23	1,92	1,77
	MAM	0,87	1,14	1,53	1,28
	JJA	2,15	2,14	2,28	2,13
	SON	1,48	1,64	1,67	1,70
T_{min} (degrees C)	DJF	1,22	1,28	1,63	1,27
	MAM	0,90	1,09	1,36	1,06
	JJA	2,13	2,36	2,46	2,24
	SON	1,83	2,08	1,96	1,98

Obs. As changes from 2001-2010 averages
Source: MoE (2011)

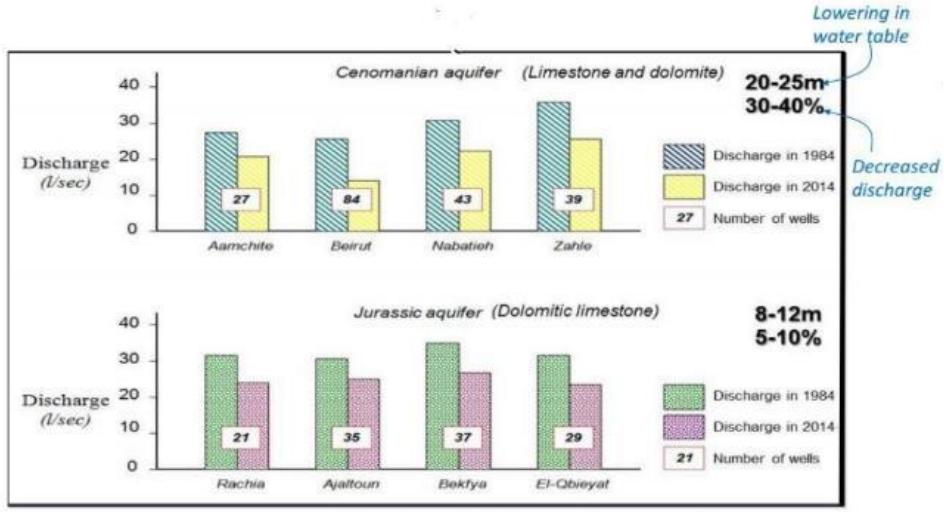
[118] Retrieved from (2018 publication): https://www.researchgate.net/publication/324265200_The_National_Plan_for_Litani_River_Remediation

[119] Retrieved from (2014 publication): https://www.aub.edu.lb/ifi/Documents/publications/working_papers/2013-2014/20140722_Higher_order_CC.pdf (p. 10)



Climate projections: Rainfall quantities (LRA)

Overall, there is a tendency for more rapid warming at higher elevations and with distance from the coast. Warming is most pronounced in spring at coastal sites and for summer at locations inland. The largest reductions to annual rainfall are found for sites in the coastal zone, and within the Bekaa Valley, where changes could be in the range 10–30 percent by the 2050s and 20–50 percent by the 2080s. The Bekaa Valley was estimated to consume 1.5 times the annual ground and surface water replenishment, leading to declining groundwater tables (Irrigation in the Near East Region, 1996).



Groundwater depletion in the major aquifers; 245 boreholes (CNRS)

Approximately 8 percent of Lebanon's population—roughly 300,000 people—live under conditions of extreme poverty, meaning that they are unable to meet basic food and non-food needs (Laithy, Abu-Ismail, and Hamdan 2008). Poverty in Lebanon is mostly an urban phenomenon, with only 25 percent of people

living below the national poverty line being rural (International Fund for Agricultural Development 2003). Northern and southern Lebanon are the poorest regions, with the Bekaa Valley not far behind.[120]

Bekaa Climate Profile (WB 2011)[121]	
Temperature Effects	The Bekaa region depends substantially on irrigation to grow crops, and the long dry summers commonly cause water shortages; The Bekaa Valley contains 46 percent of Lebanon's cultivated land (FAO 2011); pressure on the land base has led to a decline nationally in wheat production in favour of high-value crops such as vegetables; … Apple, cherry, peach, and grape crops in the Bekaa region have been harmed by the higher temperatures, decreasing their yields.
Precipitation Effects	In Lebanon, agriculture uses 60–70 percent of the country's available water (Ministry of Environment (Lebanon) 2011); Lebanon is already experiencing substantial changes in water availability: Shaban (2009) estimates that rainfall and snow cover have decreased between 12 percent and 16 percent in the last 40 years, rivers and groundwater between 23 percent and 29 percent, springs by 43 percent, and local reservoirs by 79 percent;
Pests and Pathogen Management	There is limited monitoring of pests and relevant environmental conditions to inform pesticide applications, often resulting in applications at the maximum levels (Zeid 2007)
Effects of Livestock	Meat and milk from goats, sheep, and cows, are prevalent agricultural products in Lebanon, but are secondary to other forms of agricultural production (Asmar 2011). Goats and sheep are particularly concentrated in the Bekaa Valley. Effects of overgrazing and land fragmentation due to urban sprawl have decreased herd numbers. This decrease in grazing has subsequently led to increased biomass growth, and, with it, increased intensity and frequency of forest fires (Asmar 2011).

[120] Retrieved from: http://documents.worldbank.org/curated/en/115381468249300050/pdf/Middle-East-Increasing-resilience-to-climate-change-in-the-agricultural-sector-of-the-Middle-East-the-cases-of-Jordan-and-Lebanon.pdf (p. 10, 55–60)

[121] Ibid.

ANNEX 2: Project activities visualisation and target area maps

Figure 17: Needs and proposed concrete interventions in Zahle and surrounding municipalities

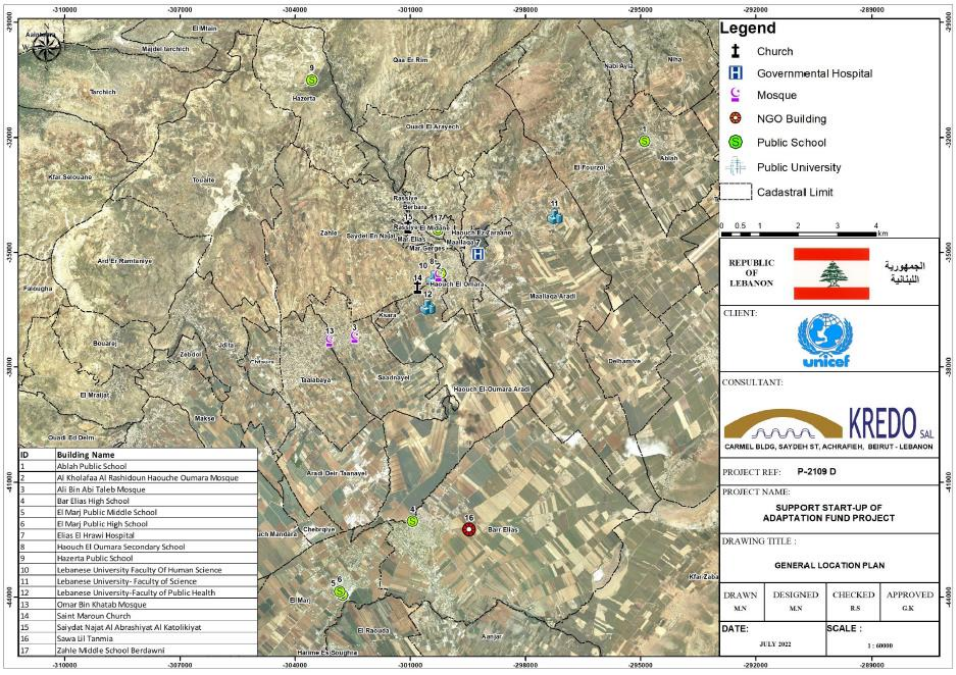


Figure 18: Schematic detail section of the Rainwater harvesting systems proposed for educational buildings in the Bekaa area

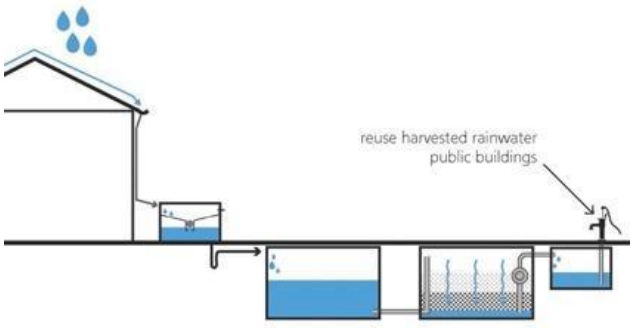


Figure 19: Map showing the proposed treated wastewater pumping line and irrigation zones

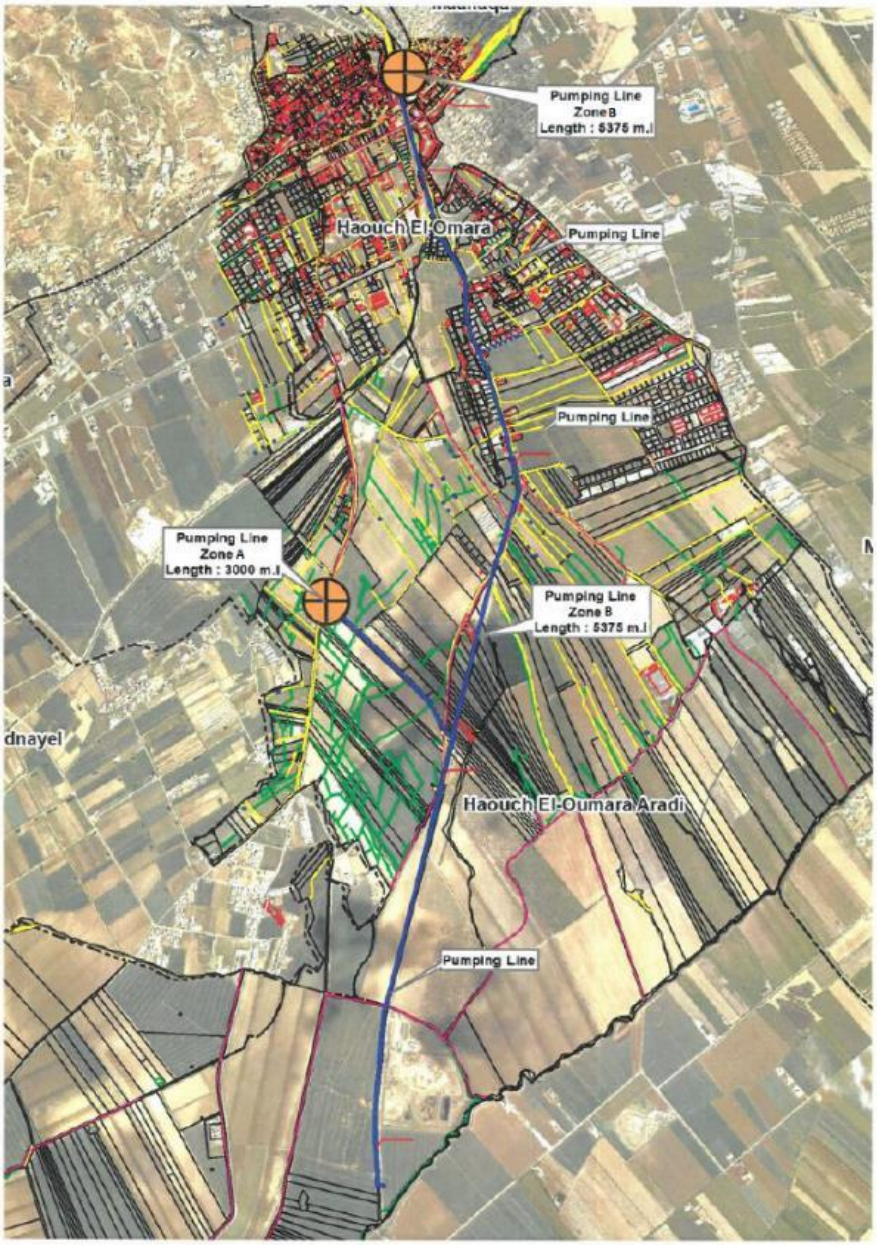


Figure 20 Permaculture demonstration site in Lebanon

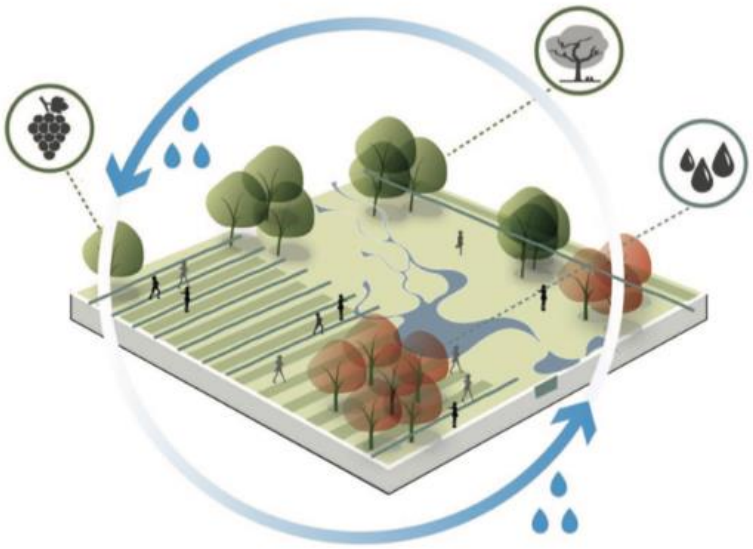


Figure 21: Proposed concrete interventions (component 3) in Jordan (Irbid, Mafraq and Jerash Governorates)

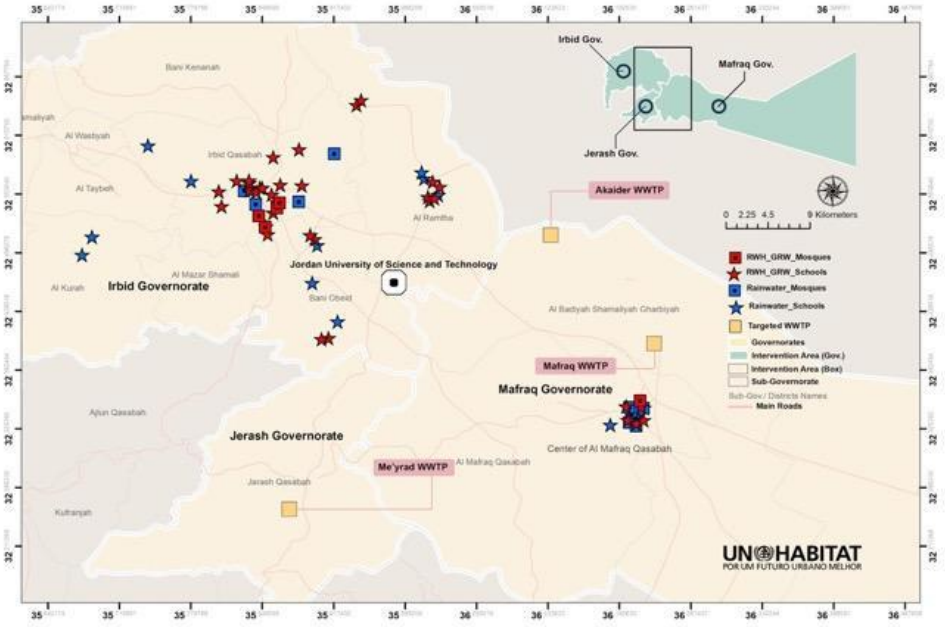


Figure 22 Proposed concrete interventions (component 3) (Irbid Zoom-in)

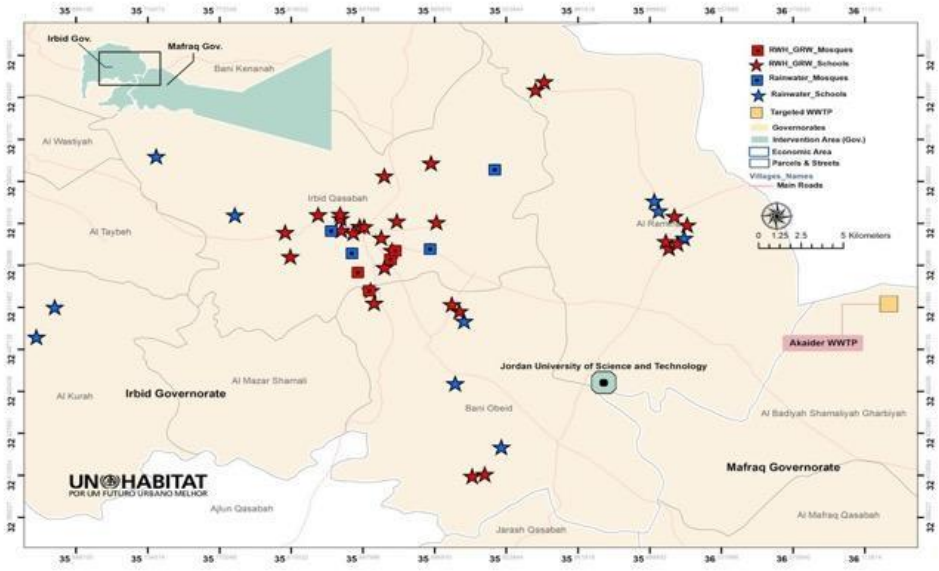


Figure 23: Proposed concrete interventions (component 3) (Mafraq Zoom-in)

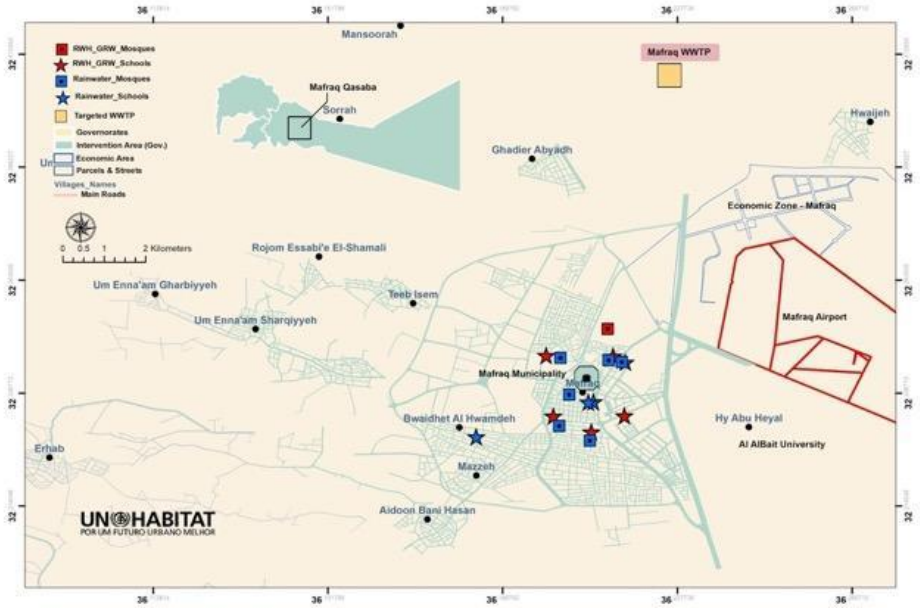


Figure 24: Schematic detailed drawing of rainwater harvesting systems proposed for schools/mosques/municipal buildings/residential buildings in Jordan

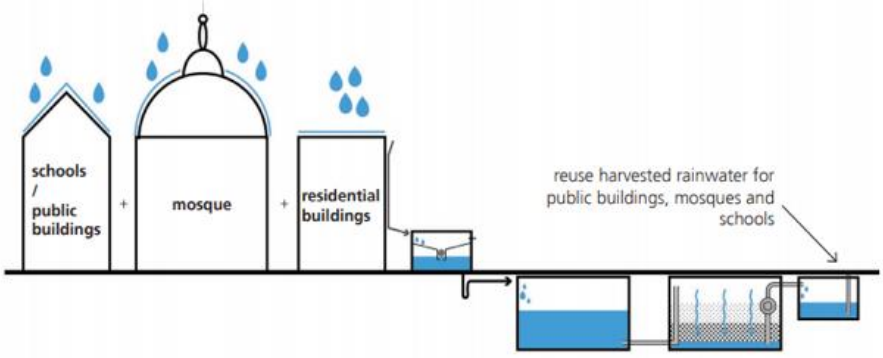


Figure 25: Greywater treatment and reuse: schematic detail section for greywater treatment and reuse system in schools and mosques

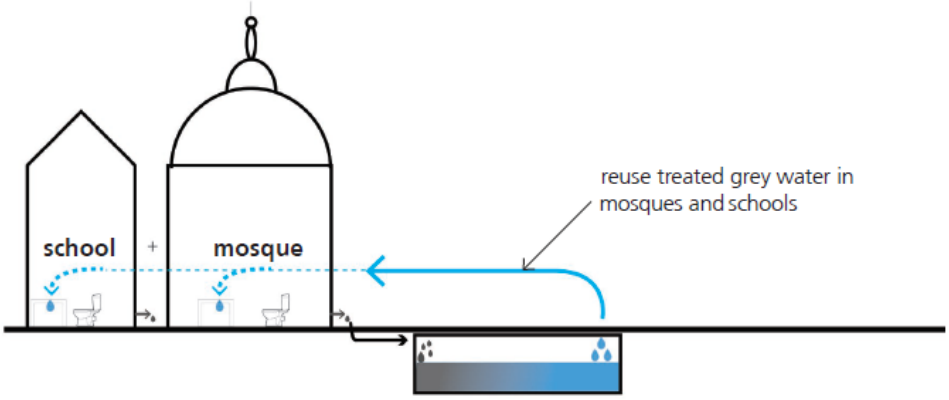


Figure 26: Location maps for three existing WWTP in Jordan to be upgraded

Waste water treatment plant Akaidr

Waste water treatment plant Maered

Waste water treatment plant Mafraq

Figure 27: Water-efficient irrigation: schematic detail drawing introducing drip irrigation for farms in Mafraq and Jerash instead of the existing surface irrigation

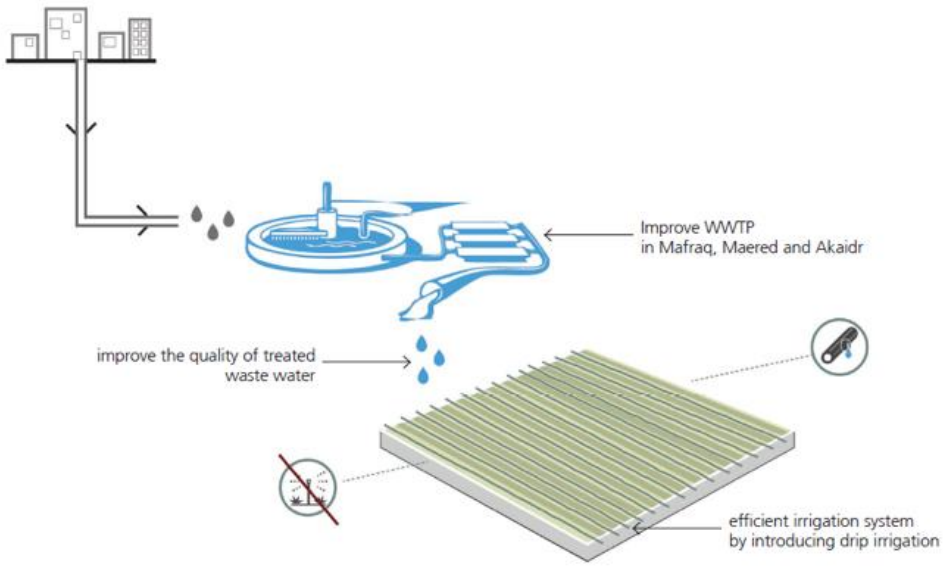
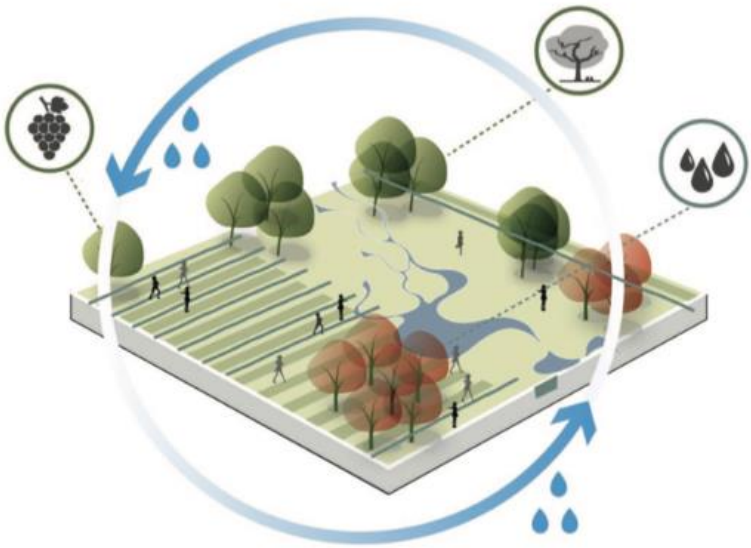


Figure 28: Permaculture demonstration site



ANNEX 3: Consultation outcomes, incl. for ESP and GP compliance

Table 32: Consultations conducted specifically to comply to AF ESP and GP

Environmental and social principles	Required to comply to AF ESP and GP	Consulted	AF ESP and GP compliance
Compliance with the Law	Identify relevant rules, regulations and standards, including procedures to comply to these for proposed interventions Identify national legal framework and guidelines for conducting EIAs for relevant projects	Ministry of Environment (Leb) Ministry of Energy and Water (MoEW - Leb) Litany River Authorities (LRA – Under the Lebanese MoEW Leb) Lebanese Agriculture Research Institute (LARI – Affiliated to the Lebanese Ministry of Agriculture (MoA)) Council for Development and Reconstruction (Leb) Ministry of Environment (Jord) Ministry of Water and Irrigation (Jord) The Ministry of Awqaf Islamic Affairs and Holy Places (Jord) Ministry of Education (Jord)	Relevant laws and how to comply have been identified (see section II.F)
Access and Equity	Identify needs and potential issues and concerns related to proposed project actions	Beneficiary groups, including women, youth, Syrians and farmers	Detailed stakeholder mapping has been conducted Consultations with vulnerable groups have been conducted
Marginalized and Vulnerable Groups		UNHCR; Beneficiary groups, including women, youth, Syrians and farmers	Detailed stakeholder mapping has been conducted Consultations with vulnerable groups have been conducted UNCHR has been consulted to understand specific needs and possible concerns of DPs
Human Rights		OHCHR; Beneficiary groups, including women, youth, Syrians and farmers	Detailed stakeholder mapping has been conducted Consultations with vulnerable groups have been conducted UN-Habitat checked what core human rights have been ratified; OHCHR has been consulted to identify possible project human rights risks
Gender Equity and Women's Empowerment		UNICEF; UN Women; Beneficiary groups, including women, youth, Syrians and farmers	Detailed stakeholder mapping has been conducted Consultations with vulnerable groups have been conducted UN Women and UNICEF have been consulted to understand specific needs and possible concerns of

			DPs. A gender baseline and approach has been developed based on a gender assessment
Core Labour Rights		ILO; Beneficiary groups, including women, youth, Syrians and farmers	Consultations with vulnerable groups have been conducted UN-Habitat checked what core Labour rights have been ratified; ILO has been consulted to identify possible risks of non-compliance to Core Labour Rights
Indigenous Peoples		Detailed stakeholder mapping has been conducted	Some Bedouins are now official Lebanese and Jordanians
Involuntary Resettlement		Municipalities; Beneficiary groups, including women, youth, Syrians and farmers	Resettlement will be avoided in all cases. All proposed activities are on public land or at building level where management / owners have agreed with the intervention
Protection of Natural Habitats	Identify any protected areas in target area	IUCN	UN-Habitat checked the IUCN Red list and consulted with IUCN regional office
Conservation of Biological Diversity	Identify potential endangered species in target area	IUCN	
Climate Change	Identify potential emissions from proposed interventions	Risks screening and impact assessment studies, including public hearings / consultations with vulnerable groups	ESIA, ESP and consultation reports have been developed by accredited national consultants; these are in the process of being approved by the ministries of environment Energy use (for e.g. wastewater treatment systems) will be compensated with PV
Pollution Prevention and Resource Efficiency	Identify if considered interventions will use large quantity of energy		
Public Health	Include specific questions in vulnerable groups survey	Beneficiary groups, including women, youth, Syrians and farmers	All interventions will support clean water supply in accordance with international standards; health risks mitigation measures are taken
Physical and Cultural Heritage	Identify heritage sites Include specific questions in vulnerable groups survey	UNESCO website	No heritage sites have been identified in close to proposed project activities areas
Lands and Soil Conservation	Map any fragile and valuable lands in target area	IUCN; studies	Proposed interventions will support sustainable land/ soil use and avoid degradation

Table 33: Detailed overview of consultations conducted.

Stakeholder	Consultation objective	Outcome	Incorporation into project design	Evidence
Ministries				
Samar Malek Acting Head of Service Environmental Technology Ministry of Environment (MoE) Lebanon	Screening process for amended output 3.4	An Environmental Impact Assessment (EIA) study should be prepared as the irrigation area is 800 hectares thus exceeding the threshold for the preparation of EIA studies which is 500 hectares based on National Decree 8633 of 2012	An EIA will be prepared at the startup of Phase 2 of component 2.4 and submitted to the MoE for their approval	Date: 20 July 2022
Samar Malek Acting Head of Service Environmental Technology Ministry of Environment (MoE) Lebanon	Align with government (ministry) priorities Avoid duplication with other projects (ministry projects) Confirm approach and focus is in line with priorities	MoE supports project on water focused in water harvesting and waste water reuse Zahle area is in high need but also complex environment If integrated water management approach / local adaptation plans are possible that would increase water use efficiency and better understanding and matching of demand and supply Lessons (for replication) from city level climate change adaptation options are very much needed in the region and this project could be an important contribution	Focus on water supply of most vulnerable through water harvesting and waste water reuse Explore feasibility and buy-in of local integrated water management approach / local adaptation plans to better match demand and supply while taking into consideration climate change projections and impacts (e.g. change in water availability from snow)	 Date: multiple times since 2018 Technique: discussion and SC meetings
Randa Nemr Advisor to the minister Ministry of Energy and Water (MoE) Lebanon	Align with priorities and needs of the ministry Mapping of relevant projects and lessons learned Understand mandates	Main priority (National water master plan) is waste water reuse because far behind on targets Water harvesting is possible when fit Connection waste water reuse to agriculture would be efficient but would require a detailed irrigation study	Focus on water supply through water harvesting and waste water reuse in target area in line with National water master plan Identify options for connecting waste water reuse to agriculture	 Date: multiple times since 2018 Technique: discussion and SC meetings
Youssef karam Irrigation, water, sewage & infrastructure department manager Council for development and reconstruction CDR Lebanon	Align with priorities and needs of the ministry Mapping of relevant projects and lessons learned Understand mandates	Priority of ministry of water is to construct dams to profit from water Projects with small check dams, to harvest and irrigate water, which is possible in Zahle area, is needed Water from Zahle waste water treatment plant can be used for agriculture irrigation; however, irrigation study is needed Studies required for project: impact of snow melt, impact of more rain in less time	Sub-projects with small check dams, to harvest and irrigate water in Zahle (also identified my mayor) Water from Zahle waste water treatment plant can be used for agriculture irrigation. Irrigation study is needed Studies within project: impact of snow melt, impact of more rain in less time	 Date: multiple times since 2018 Technique: discussion and SC meetings

Dr Ahmad N. Abdel-Fattah General manager (AF project in Jordan)	Identify lessons learned from AF project Coordinate with MOPIC	Permaculture approach is promising as adaptation measure, also in urban context No national initiative for rooftop harvesting in Jordan while top priority in TNA – explore option for cooperation with water authority and municipality to set-up nationa programme with cost-sharing and possible tax measures to promote rooftop water harvesting Awareness raising required, e.g. at schools	Permaculture in urban context and in farms considered as option Explore options to set-up national initiative for rooftop rainwater harvesting, including on schools	 Date: 18-11-2018 + follow-ups Technique: discussion
Colin Gleichmann Head of Environment & climate portfolio Rahel Hermann Project manager GIZ (in Ministry of Environment Jordan)	Mapping of relevant projects and lessons learned Understand priorities in forthcoming NAP which is being developed by GIZ	Emerging issue and mentioned in forthcoming NAP are pressure of refugees on water services and floods	Refer to NAP in proposal	 Date: 18-11-2018 Technique: discussion
Ms. Dina Kisbi, Director of Climate Change Directorate Ms. Sarah Al Haleeq, head of Adaptation Section, And Mr. Bilal Shaqareen Ministry of Environment	Align with priorities and needs of the ministry Mapping of relevant projects and lessons learned Understand mandate and role	MoEnv is currently working on NAP with GIZ Water harvesting is a top priority in the TNA There is a lack of land use management plans that take into consideration climate change Building codes is not compatible with climate change	Refer to NAP in proposal Scale up rooftop rainwater harvesting Mainstream climate change adaptation into local spatial plans. Review building codes and incorporate rooftop rain water harvesting.	 Date: 24-10-2018 Technique: discussion
Eng. Mohammad Al Dwairi, Acting Secretary General Assistant for Strategic Planning, and and Mr. Adel Alobeiaat and Dr. Basim Hassan, Strategic Planning Specialist. Ministry of Water& Irrigation	Align with priorities and needs of the ministry Mapping of relevant projects and lessons learned Understand mandate and role	Priority of ministry of water is to focus on rainwater harvesting. Focus on water efficiency and invest in rainwater harvesting in remote areas and from rooftops. The Ministry is currently working on drought assessment.	Rooftop rainwater harvesting at household level and in farms considered as option. Identify options to incorporate water saving devices and raise public awareness.	 Date: multiple times since 2018 Technique: discussion and SC meetings
Ms. Dalal Eliwah Study and Design Manager- technical Affairas, Yarmouk Water	Align with priorities and needs of the Yarmouk Water Company	Complement the needs of YW projects current and future projects Contribute in reduction water demand of YW beneficiaries through providing additional water supplies resources	Increase rain water harvesting from rooftops Increase the use of Water Saving Devices to conserve precious water	

Company	Mapping of relevant projects and lessons learned Understand mandate and role		resources Enhance regular use of greywater treatment and reuse in public buildings to relief increasing demands on fresh water resources.	 Date: multiple times since 2018 Technique: discussion and SC meetings
Eng. Lamia Sharif Al-Qawasmeh, Director of Planning and Development Department, previously Ministry of Municipal Affairs (MoMA), now, Ministry of Local Administration (MoLA)	Align with priorities and needs of the ministry Mapping of relevant MSSRP projects funded by the WB and lessons learned Understand mandate and role	Urban flooding is an issue in municipalities Coordinate to avoid possible duplications of actitivities, e.g. constructing box culverts in Mafraq Follow up on Innovation Fund outcomes in order to avoid \ complement and align the activities of the two projects (i.e. MSSRP and AF-Project)	Rehabilitation of exsiting water collection system such as existing ponds which colelcts runoff water from wadis and streets during winter time. Follow up on the relevant outcomes of the needs guide being prepared by the MSSRP.	 Date: multiple times since 2018 Technique: discussion and SC meetings
Dr. Sami Alawiyeh Chairman/ General Manager of LRA (Lebanon)	Align with priorities and needs of LRA combatting pollution on the litany River Mapping of relevant projects and lessons learned, esp benefits to the surrounding ecosystem and agriculture Understand mandates	High discharge of waste water, industrial waste and other wastes into Litany River Farmers pumping sewage water to irrigate crops around the river High violations on the river banks River buffer zone 200m from its banks	Constructed Wetlands in Bar Elias on plots owned by LRA	 Date: 05-12-2019
Ihab Jomaa, PhD Head of the Department of Irrigation and Agrometeorology at the LARI (Lebanon)	Align with priorities and needs of the MoA Mapping of relevant projects, trainings for farmers, and lessons learned Understand mandates	Efficient irrigation techniques are often misused by farmers Involvement in crops testing and experiments and farmers training (LARI releases new varieties of wheat and barley after testing them to climate conditions on a yearly basis to the market) No national guidelines for wastewater reuse, using FAO 2010 instead. Farmers do not pay for irrigation water	Efficient irrigation techniques for potato crops Efficient irrigation techniques for fruit trees Capacity building for farmers cooperatives Confirm permaculture standards and application	 Date: 05-12-2019

			Other virtual meeting during COVID-19 lock down	 Date: 06-02-2020
UN agencies (relevant projects, target area issues and needs and ESP and GP potential risks identification)				
Olivier Thonet Chief of WASH UNICEF Lebanon	Mapping of relevant projects and lessons learned Understand needs and issues in target area Consultations for AF ESP and GP compliance (gender assessment) Discuss possible cooperation / coordination	UNICEF follows MoE (National water master plan) and municipal needs to increase connections of settlements to water resources, especially ground water wells UN-H can complement UNICEF work with focus on climate change adaptation in target area	Compliment UNICEF work in target area by focus on water harvesting and reuse and consideration of climate change	 Date: multiple times since 2018 Technique: discussion and SC meetings
Jose A. Gesti canuto Chief of WASH UNICEF Jordan		UN-H can complement UNICEF work with focus on climate change adaptation in target area UNICEF possible executing partner		 Date: multiple times since 2018 Technique: discussion and SC meetings
Renata Raad WASH Officer UNHCR Lebanon	Mapping of relevant projects and lessons learned Understand needs and issues in target area Consultations for AF ESP and GP compliance (equall access, vulnerable groups and human rights approach) Discuss possible cooperation / coordination	Important to have a community approach to avoid social tension over water resources (equal access) UNHCR has specific focus on women headed households, children without care and disabled Water supply project require risk mitigation measures on waste and soil (to have access to water in environmentally friendly way) and water rights (since these are not clear UN-H can complement UNHCR work with focus on climate change adaptation	Design project so it avoids risks related to social tension over water resources, pollution and environmental unfriendly use (waste and soil) and water rights Consider needs women headed households, children and disabled	 Date: 06-11-2018 Technique: discussion
Vincent Dupin Senior technical officer Roelof Wentzel WASH offcer UNHCR Jordan		UNHCR has relevant refugee vulnerability profile related to livelihood and shelter Issue identified: municipality has challenges providing enough water in dry season Possible innovative technique: easy to dismantle and to be shipped to other location waste water treatment plant (in container)	Explore option of using possible innovative technique: easy to dismantle and to be shipped to other location waste water treatment plant (in container) – relevant for uncertain urbanization, e.g. with influx and departure refugees	

				Date: 18-11-2018 Technique: discussion
Vahakn Kabakian AF focal point, also working for UNDP UNDP Lebanon	Mapping of relevant projects and lessons learned Understand needs and issues in target area	Focus on water supply of most vulnerable through water harvesting and waste water reuse	Focus on water supply of most vulnerable through water harvesting and waste water reuse	 Date: 09-11-2018 Technique: discussion
Nedal M.Al-Ouran Head of env. CC and DRR portf UNDP Jordan		GCF proposal under review – other geographic focus but UNDP and UN-H will coordinate proposal development UNDP is piloting rainwater harvesting in public building Suggest to identify unused or not properly used already existing water harvesting systems and make better used of these	Include focus on identifying unused or not properly used already existing water harvesting systems (make better use of them) Conduct educational awarenss programmes on climate related-water issues Promote non-conventional water options and focus on alternastive water sources such as grey water. Contact and involve governance councils and boost their decentralisation role Benefit and disseminate indigenous knowledge on water harvesting.	 Date: 19-11-2018 Technique: discussion
Nasredin Hag Elamin Representative in Jordan Talal Al-Fayez Programme expert FAO Jordan	Mapping of relevant projects and lessons learned Understand needs and issues in target area Consultations for AF ESP and GP compliance (lands and soil conservation)	FAO to share study on existing and potential water harvesting locations in Jordan FAO to share best practice on water harvesting options in Mafraq	A sub-sector strategy for water harvesting is needed to ensure the continued development of this alternative in a way that is effective and sustainable. Developing a sub-sector strategy on water harvesting and ensure equitable approach that benefits all groups. Diversify agricultural water supply and to improve agricultural water security. Water harvesting could be particularly useful in Mafraq Region for supporting the cultivation of fodder crops, given the existing importance of livestock in the area.	 Date: 19-11-2018 Technique: discussion

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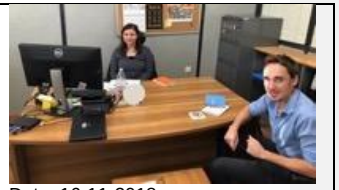
Sarah El jamal Programme officer Regional office for Arab States ILO Lebanon	Mapping of relevant projects and lessons learned Understand needs and issues in target area Consultations for AF ESP and GP compliance (core labour rights)	Agriculture: Lebanon and Jordan have both not ratified **C129** - Labour Inspection (Agriculture) Convention, 1969 (No. 129) Construction: Lebanon and Jordan have both not ratified **C167** - Safety and Health in Construction Convention, 1988 (No. 167) Migrant workers: Lebanon and Jordan have both not ratified **C143** - Migrant Workers (Supplementary Provisions) Convention, 1975 (No. 143) Women: Lebanon and Jordan have both not ratified **P089** - Protocol of 1990 to the Night Work (Women) Convention (Revised), 1948	Refer to core labour rights, technical conventions for safety and health and CBA in any contract Ensure safety and health measures are taken during project (especially for women and DPs) and are inspected during project Coordinate with ILO on skills needs and ILO projects	 Date: 16-11-2018 Technique: discussion
Patrick Daru Country coordinator ILO Jordan		Main potential issue / risk in Jordan: Convention 81 – labor inspection convention. Although ratified there is limited inspection capacity Increase in child labor (because refugees often work with whole family) Safety / harassment issues for women Figures: Not many women in construction, but many in agriculture Improvements and projects: Collective Bargaining Agreement (CBA) by 2019 Shawish (mediator) protect wage of Syrian refugees Flexible work permit for Syrian refugees (not dependent on one employer)		 Date: 19-11-2018 Technique: discussion
Faten Tibi Programme Manager Women and Youth Empowerment Programme in Host communities UN Women Lebanon + Syria	Mapping of relevant projects and lessons learned Understand needs and issues in target area Consultations for AF ESP and GP compliance (gender assessment)	Many women (incl. Beduin) work in agriculture + food processing. Men work in agriculture, transport and markets Education of women is in general more modest than men Syrians only work in agriculture (allowed) In women empowerment project there are no issues between Syrian and Lebanese women Need to ensure secure / safe environment (i.e. protection) for women during work since gender-based violence can still be an issue in the region	Consider women roles in agriculture and water handling when designing the project Ensure women protection measures are in place for the project (when needed)	 Date: 08-11-2018 Technique: discussion
Hazar Asfoura Programme Analyst, Women's Economic Empowerment Resileince and Empowerment Unit. UN Women Jordan		Many women are working in agricultural sector in Jordan and thus affected by water scarcity. Due to water scarcity women who are engaged in agriculture sector are moving from one place to another following water availability Water scarcity is one of the reasons that prevent women from getting decent working opportunities in agricultural sector. Rural women's existing theoretical knowledge and understanding of climate change and adaptation remain limited, impeding their ability and willingness to act and find long term adaptive solutions. When asked about the services they would like better access to, only 25% of Women reported wanting better access to water compared to 37% of men. This is mainly influenced by gendered household roles.	Raising rural women's awareness on conservation techniques and climate change processes, proper greywater re-use and water harvesting techniques to strengthen climate-change adaptation processes. Strengthening rural women's leadership capacities so that they better engage in adaptive responses to climate change. fostering rural women's capacities to act and make significant achievements in adapting to climate change	 Date: 30-12-2018 Technique: Discussion

Mazan Shaqoura Deputy regional representative OHCHR Lebanon	Mapping of relevant projects and lessons learned Understand needs and issues in target area Consultations for AF ESP and GP compliance (human rights)	Jordan and Lebanon have both not ratified core Human right[122] W - INTERNATIONAL CONVENTION ON THE PROTECTION OF THE RIGHTS OF ALL MIGRANT WORKERS AND MEMBERS OF THEIR FAMILIES. THEREFORE, THE PROJECT NEEDS TO ENSURE DPS (AND LEBANESE) HAVE EQUAL ACCESS TO WORK OPTIONS AND ARE EQUALLY TREATED / REWARDED.	Include measures and clauses in contract to ensure on the left	 Date: 16-11-2018 Technique: discussion
Ali Hayajneh Water and CC programme IUCN regional (Lebanon and Jordan)	Mapping of relevant projects and lessons learned Understand needs and issues in target area Consultations for AF ESP and GP compliance (natural habitats, biodiversity and soils)	IUCN is developing water security action plans at municipal level IUCN helped to identify potential (sub-project risks related to natural habitats, biodiversity and fragile soils in target areas Irbid and Mafraq are located within two eco-regions, there is one national designed protected area in Irbid (Yarmouk forest reserve) and there are some important bird areas Zahle district and surrounding municipalities are part of two eco-region. Zahle distract includes 5 Hima areas; Kafer Zabad 20km2 , Anjar 20km2, Kherbet kanfar 21.4km2, Ainzebde5.5Km2, Tarshish 10km2, these area are important for the local communities as they provide a common practice of grazing and Agriculture production. There are also some important bird, mammal and flora areas close-by	The target areas are located in eco-regions with some vulnerable protected areas and animals. Proposed interventions are planned in urban areas and are expected to don't negatively interrupt these because of limited disruption of water flows (of seasonal streams) and land / soil interventions. However, during the full proposal, this will be studies and assessed in detail.	 Date: 19-11-2018 Technique: discussion
Sally Zgheib Water supply & sanitation specialist; Amal Talbi Senior Water Resources Management Specialist Shafick Hoossein Head of Environment and natural resources of Mashreq regions (Washington D.C) World Bank	Mapping of relevant projects and lessons learned Understand needs and issues in target area Discuss possible cooperation / coordination	Ensure to avoid social tension between groups and areas, also by understanding impact on interventions upstream and downstream – use intergrated water management approach Using treated waster water from Zahle plant is a good option to increase water use efficiency.	Avoid social tension and negative impacts of interventions through impact assessment (full proposal) Use intergrated water resource management approach if agreed by national government and local authorities	 Date: 08-11-2018 Technique: discussion

[122] https://www.ohchr.org/EN/Countries/MENARegion/Pages/JOIndex.aspx

Mirage for Waste Management & Environmental Services Zahle waste water treatment plant operator. Lebanon	Understand needs and issues in target area and how waste water can be used for agriculture	Waste water is currently being directed to Litani river but could be used for agriculture, especially in low(er) lying areas to avoid much pumping Feasibility waste water reuse for agriculture depends on crop and level of treatment	Design option for waster water reuse from Zahle waste water reuse plant for agriculture use and specific type of crops (fruit)	 Date: multiple times since 2018 Technique: discussion and SC meetings
Aya Housheimi WASH Coordinator – Zahle-Lebanon Norwegian Refugee Council Lebanon	Mapping of relevant projects and lessons learned Understand needs and issues in target area Consultations for AF ESP and GP compliance (human rights and ILO standards and approach for Syrian refugees)	The refugees rely on agricultural boreholes and shallow boreholes for household water supply. Due to drought those boreholes are getting drier, and more contaminated. Diseases, as a result of lessened personal hygiene, and household hygiene. Safety Protection Risks: Refugees, mainly women and children, travel long outside ITS looking for other water resources, which puts them in danger.	Rain water harvesting	 Date: 07-12-2018
Steering Committee Meetings Lebanon (MoE representative, MoEW representative, UNICEF, UN-Habitat and Consultant)	Align with priorities and needs of the ministries Mapping of relevant projects and lessons learned Understand mandates	Farmers not paying for the treated waste water usage Proper O&M of the Zahle WWTP Irrigation guidelines still not issued, currently being developed between MoEW and LIBNOR	Physical interventions cleared	 Dates: 18-09-2019 07-10-2019
Local Authorities				
Municipality of Zahle Mayor Assaad Zougheib Mr Antoine Abi Youniss	Initiation of detailed assessment phase under components 2 and 3	Request to amend conveying system to store treated wastewater increase surface area irrigated with treated wastewater	Request of amendment of project to 1- increase the surface area irrigated by treated wastewater, 2- construct a storage reservoir accommodating 50% of the daily discharge from the wastewater treatment plant, and 3-	26 May 2022 29 June 2022

			pump the wastewater to two locations from where it can be distributed by gravity by the farmers	
Municipality of Marj Mayor Mnawar Al Jarrah Mr Ali Ibrahim	Initiation of detailed assessment phase under components 2 and 3	Request to consider replacing some of the earlier proposed buildings to be targeted by rainwater harvesting as they do not have high water demand or experience water shortage	The new proposed buildings were assessed and found to be unfeasible to target under the project	14 June 2022
Union of Municipalities of Central Bekaa Mr Mohammad El Bast	Initiation of detailed assessment phase under components 2 and 3	Need to consider most vulnerable farmers in selection of project beneficiaries	A framework will be used for the selection of the most vulnerable beneficiaries	29 June 2022
Mafraq Greater Municipality Mayor Nasser Eldine Abdullah	Initiation of assessment phase for components 1.3 and 4.3	The meeting highlighted the capacity of the municipality and their resources available in order to further carry out this component and make sure to utilize this opportunity as much as possible	All the outcomes and findings in the meeting will be incorporated in the TORs to be finalized for the components discussed	13 July 2022
Irbid Greater Municipality Mayor Nabil Al-Kofahy	Initiation of assessment phase for components 1.3 and 4.3	The meeting highlighted the capacity of the municipality and their resources available in order to further carry out this component and make sure to utilize this opportunity as much as possible	All the outcomes and findings in the meeting will be incorporated in the TORs to be finalized for the components discussed	13 July 2022
Collective meeting between Greater Irbid Municipality, Mafraq Greater Municipality, and Ministry of Local Adminstration	Introducing the project to the newly appointed mayors and teams in both municipalities	All of the parties involved in the meeting were fully introduced to the overall details of the project and understood their exact roles , and how they will need to support the project in order make sure that the project goals and outputs are fulfilled.	The local authorities re-assured their readiness and investment in this project, and want to cooperate to full extent in order to make sure everything takes place as planned	7 July 2022
Local farmers' representatives				
George Doummar George Sakr Fadi Skaff	Initiation of detailed assessment phase under components 2 and 3	Problems in availability and quality of irrigation water Water shortage in dry season (due to low river flow) Request to store water Request to provide treated wastewater for use in irrigation Need of provision of irrigation water at no cost and energy	Request of amendment of project to 1- increase the surface area irrigated by treated wastewater, 2- construct a storage reservoir accommodating 50% of the daily discharge from the wastewater treatment plant, and 3- pump the wastewater to two locations from where it can be distributed by gravity by the farmers	2 July 2022
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ANNEX 4: ESP annex, incl. ESMP

Content:

1.1. Introduction, including summary description of the project/ programme

Introduction
Social and environmental policies are essential tools to prevent and / or mitigate undue harm of projects and project activities to people and their environment. In line with the Adaptation Fund's ESP and UN-Habitat's Environmental and Social Safeguard Policy (ESSP), UN-Habitat and partners are required to categorize the risk of the project as a whole and to manage potential risks and impacts.

Purpose
The purpose of this 'ESP annex' is to demonstrate (in an overview) how this project complies to the AF ESP. The annex shows what potential environmental and social risks and co-benefits and opportunities have been identified per project activity, the potential impacts of the risks and how these will be managed. This proposal and related country-specific ESIA-ESMP and consultation reports are being published on UN-habitat ROAS website: https://unhabitat.org/af-lebanon-jordan

Methodology
To ensure compliance with the AF ESP, all proposed project activities have been screened against the 15 AF principles (i.e. safeguards) to identify potential environmental and social risks and to assess related potential impacts. Where risks have been identified, impact assessments have been conducted and where needed, measures to avoid or mitigate risks and impact, identified (+ monitoring arrangements)

In both Jordan and Lebanon, risks screening sheets have been completed for each proposed project activity. Besides that, in both countries, accredited consultants prepared country-specific ESIAs, ESMPs and consultations reports in compliance with the AF ESP and GP and national requirements for conducting ESIAs. **Details in these reports, including risks mitigation measures, will be integrated in (sub)project execution plans, including for construction, operation and maintenance**. Below shows an overview / summary of these reports (most important findings) and the outcomes have been consolidated in the proposal, including in the budget. The country specific ESIAs, ESMPs and consultations reports are available through above website. The completed risks screening sheets for each project activity are available on request.

In addition to the above, an amendment was proposed to output 3.4 in Lebanon, Construction of treated wastewater storage and conveying system (as described in section II-A), which was screened with the guidance of the Ministry of Environment (MoE) and found to require the preparation of an EIA study. The latter study will be prepared and submitted to MoE for approval at the startup of Phase 2 of output 2.4 and will equally be used to mitigate environmental and social risks during the execution of output 3.4 which will not start before the completion and approval of the EIA study.

Data and analysis are provided based on collected disaggregated data focused on identification of climate change related needs, limitations, constraints and requirements specific for marginalized and vulnerable groups, especially of women and youth. Activity prioritization and the identification and verification of potential risks and impacts and, where needed, identification of measures to avoid or mitigate potential risks have been done with project beneficiary groups (through community surveys, focus groups discussions and community planning and decision-making processes during project preparation).

Overview / summary of project risks management approach

Table 34 overview / summary of project risks management approach.

ESP principle	Initial environmental or social risks present as per table in Part II.L Y/N	Impacts assessment	Safeguard measures	Monitoring indicator(s)	Baseline condition for each monitoring indicator
1 - Compliance with the law	No				
2 - Access and equity	No				
3 – Marginalized and vulnerable Groups	No				
4 – Human rights	No				
5 – Gender equality and women's empowerment	No				
6 – Core labour rights	No				
7 – Indigenous peoples	No				
8 – Involuntary resettlement	No				
9 – Protection of natural habitats	No				
10 – Conservation of biological diversity	No				
11 – Climate change	No				
12 – Pollution prevention and resource efficiency	Yes. Pollution. On-plant accidental spills, overflows, seepages and discharges of wastewater treatment may contaminate soil, groundwater or surface water from WWTP	Spills, overflows and seepages are at plant level and can be contained there	Carry out regular inspections and routine tests to avoid spills, overflows, seepages and discharge of low-quality water (see also water quality testing below); include detailed risks mitigation measures identified in country-specific ESIA-ESMP reports in construction, operation and maintenance plans;	Monitoring of wastewater handling and possible spills, overflows and seepages. Construction and O & M report addressing above	Check standards for water quality, treatment and construction
13 – Public health	Yes. Safe water: water quality from RWH and GWTR systems may not comply to standards	Jordan: 6486 RWH and 40 GWRT systems with following direct beneficiaries: 52,85542,284 Lebanon: 20 10 RWH systems with following direct beneficiaries: 8,75316,360	Rainwater collected will be treated using sand and carbon filter, a micro filter, and chlorine. This will ensure water quality compliance. Note that tap water is not used for drinking or cooking. Water and roofs will be regularly monitored, especially at the start of the rainy season; Filter will be changed annually, as per supplier recommendation. The chlorine tank should not be empty so there will be no pumping of air that impacts water quality; Students and building staff will be made aware (through	Water quality monitoring complying to standards; Awareness raising campaign; O & M (training) reports with attendance lists and photos; checking of filters and chlorine tank	Water quality check (compliance to tap water quality standards) Check filters and chlorine tank

			curriculum) of requirements of using water + involved in operation and maintenance; Remote monitoring systems will be installed		
	Yes. Safe water: treated waste water used for irrigation may not comply to quality standards / unmonitored irrigation water may reduce quality of crops; also covid-19 may be detected in water entering the treatment facility	Jordan: Extra from Maerad WWTP: storage tank with a capacity of 2,000~~3,000~~m^3 Exra from Al Kaider: Storage tank with a 500~~2,000~~m^3 Extra from Mafraq: 9,000 m3 Lebanon: From Zahle WWTP: ~~18~~20,000 m^3	Although the project intervention aims to increase the quality of water for irrigation, regular testing of water quality, incl for covid-19 is required and irrigation will only begin after testing; Farmers will be made aware of requirements for use + involved in operation and maintenance;	Water quality monitoring of the effluent from the WWTP. The level of treatment is tertiary. This needs to be checked on a regular basis.	Water quality check (compliance with FAO guidelines for irrigation)
14 – Physical and cultural heritage	No				
15 – Lands and soil conservation	No				

1.2. Screening and categorization

Based on the screening against the 15 AF principles, the project has been categorised as a "B" category project in terms of the environmental and social risks it poses. See Part II.L

According to the Jordan's EIA Regulations, particularly the EIA By-Law No. 37 of the Year (2005), the project has been categorized as "*Category III*" project, which imply that the proposed interventions in Jordan have no considerable risks or adverse impacts, thus not requiring full EIAs. This is due to the fact that all of the construction activities and installations of proposed sub-projects are not substantial and will be constructed or installed in already built and operating facilities, such as fully-functioning WWTPs, which at the time of original construction have been subjected to MoEnv's incumbent EIA regulations and supervision. However, although no impact assessments were required by national law, a full ESIA and ESMP report has been developed for the proposed project activities / outputs in Jordan, accompanied by a consultations report.

According to Lebanese decree 8633 MoE, 2012, Annex 1, except for amended output 3.4 for which a full EIA study is required, all the other proposed project activities / outputs don't require full EIAs as the associated construction activities and installations are not substantial and will be constructed or installed in already built and operating facilities. ~~the proposed project activities / outputs don't required full EIAs, Similarly to Jordan, all of the construction activities and installations are not substantial and will be constructed or installed in already built and operating facilities.~~ To comply to the AF requirements, risks screening and impact assessments have also been conducted for all proposed project activities.

For an overview of project activities' screening results against the 15 AF principles see table below. For details, see the next section.

Table 35: Overview of project activities' screening results against the 15 AF risk areas / principles. For more details see country-specific ESIA reports

Detailed outputs / activities	Risk screening result	Explanation why triggered or not
Component 1: Increasing the resilience of municipal governments: Manage urban risks and vulnerabilities in the context of climate change, esp. water scarcity challenges, and urban (population) growth, incl. from DPs migration		
Territorial planning and development strategy / guidelines at district level with climate change and gender mainstreamed (Lebanon)	No risks identified	Activities involve assessment and planning processes. Potential risks considered are those related to unequal access and equity, also for vulnerable groups and gender, throughout the assessment and planning processes and identification of gender sensitive action plans. However, the execution entities involved will be required to involve beneficiary groups, including identified vulnerable groups (and women and youth) in the activities. Targets and quotas will be used. These will be verified during the project inception phase with execution entity specific baseline and targets and action plans, also to involve women and youth and other vulnerable groups.
Urban master plans at municipal level with climate change and gender mainstreamed (Lebanon)		
Urban master plans at municipal level with climate change and gender mainstreamed (Jordan)		
Component 2: Increasing the resilience of citizens (DPs and host communities): Improve awareness, ownership and capacities to respond to climate change, incl. to operate, maintain and replicate resilient water harvesting, supply and irrigation systems		
Community organization, awareness and capacity building + operation, maintenance and replication / upscaling plans for concrete adaptation output 3.1: Rooftop Rainwater Harvesting in Lebanon	No risks identified	Activities involve awareness raising and capacity building activities. Potential risks considered are those related to unequal access and equity, also for vulnerable groups and gender. However, the execution entities involved will be required to involve beneficiary groups, including identified vulnerable groups (and women and youth) in the activities. Targets and if needed, quotas will be used. These will be verified during the project inception phase with execution entity specific baseline and targets and action plans, also to involve women and youth and other vulnerable groups.
Community organization, awareness and capacity building + operation, maintenance and replication / upscaling plans for concrete adaptation output 3.1: Rooftop Rainwater Harvesting in Jordan		
Community organization, awareness and capacity building + operation, maintenance and replication / upscaling plans for concrete adaptation output 3.3: Grey Water Treatment and Reuse in Jordan		
Community organisation, awareness and capacity building + operation, maintenance and replication and upscaling plans for concrete adaptation output 3.4: Efficient treatment and reuse of wastewater from Zahle WWTP, in Lebanon		
Community organization, awareness and capacity building + operation, maintenance and replication and upscaling plans for concrete adaptation output 3.5: Efficient treatment and reuse of wastewater in Jordan		
Community organization, awareness and capacity building + operation, maintenance and replication and upscaling plans for concrete adaptation output 3.6: Water-use-efficient irrigation of treated wastewater for fruit trees in Lebanon		
Community organization, awareness and capacity building + operation, maintenance and replication and upscaling plans for concrete adaptation output 3.7: Water-use Efficient irrigation of treated wastewater from Maerad and Al Kaider WWTPs in Jordan		
Community organization, awareness and capacity building + operation, maintenance and replication and upscaling plans for concrete adaptation output 3.7: Water-use Efficient irrigation of treated wastewater from Mafraq WWTP in Jordan		
Community organization, awareness and capacity building + operation, maintenance and replication and upscaling plans for concrete adaptation output 3.8; permaculture demonstration		
Community organization, awareness and capacity building + operation, maintenance and replication and upscaling plans for concrete adaptation output 3.9; permaculture demonstration		
Component 3: Increasing the adaptive capacity of the water sector: Expand unconventional water harvesting, supply and irrigation options, using innovative and replicable techniques suitable for the context		
Rooftop rainwater harvesting in Lebanon		

Rooftop rainwater harvesting in Jordan	Potential health risk (AF 13) (with some linkage to pollution prevention (AF 12)	Safe water: water quality from RWH and GWTR systems may not comply to standards
Greywater treatment and reuse in Jordan		
Efficient treatment and reuse of wastewater from Zahle WWTP, in Lebanon	Potential health risk (AF 13) (with some linkage to pollution prevention (AF 12)	Safe water: water used for irrigation may not comply to quality standards / unmonitored irrigation water may reduce quality of crops. Also covid-19 may be detected in water entering the treatment facility Pollution: there is a small risk of contamination of soil, groundwater or surface water from on-plant accidental spills, overflows, seepages and discharges.
Efficient treatment and reuse of wastewater in Jordan (Maered WWTP)		
Efficient treatment and reuse of wastewater in Jordan (Al Akaider WWTP)		
Efficient treatment and reuse of wastewater in Jordan (Mafraq WWTP)		
~~Water-use efficient irrigation of treated wastewater for fruit trees in Lebanonfrom Zahle WWTP, Lebanon~~	No risks identified	Activities mainly involve installing water efficient irrigation systems. The source of water will come from activities under outputs above, so potential risks related to safe water are handled under above outputs. Under comp 2, target communities will be organised and involved.
Water-use Efficient irrigation of treated wastewater from Mearad and Al kaider WWTP		
Water-use Efficient irrigation of treated wastewater from Mafraq WWTP, Jordad		
Permaculture demonstration – efficient water use system	No risks identified	Activities are very localised at ~~JUST siteLARI~~local university/ research centre premises and other private farms premises
Component 4: Improving knowledge and policies and regulations to increase urban resilience in the region: Project KM and replication, incl. development of regional urban risks and vulnerabilities management model in the context of climate change and urban (population) growth (incl. from DPs migration)		
Regional / international KM with focus on sharing project lessons and replication	No risks identified	Activities include knowledge exchange though meetings, site visits, events, etc. UN-Habitat and UN-ESCWA will ensure equal involvement / representation.
Jordan and Lebanon KM with focus on project progress, best practices and lessons learned		
Sub-national KM and Regional' urban risks and vulnerabilities assessment, planning and management approach model for type 2 cities	No risks identified	Activities include desk top consultancy work
Incentive mechanism (financial) and regulatory framework to replicate and upscale rainwater harvesting activities	No risks identified	Activities include desk top consultancy work

Details and results of the risks screening process
***For more details see country-specific ESIA reports

Principle 1: *Compliance with the Law.*
Screening result: no potential risk
Explanation: During project preparation, all relevant rules, regulations and standards have been identified for all proposed project activities, including procedures / steps to comply to these. These are shown in Part II.F. Where required by national law, EIAs have been completed before the start of the project. Therefore, no potential risk of non-compliance exists.

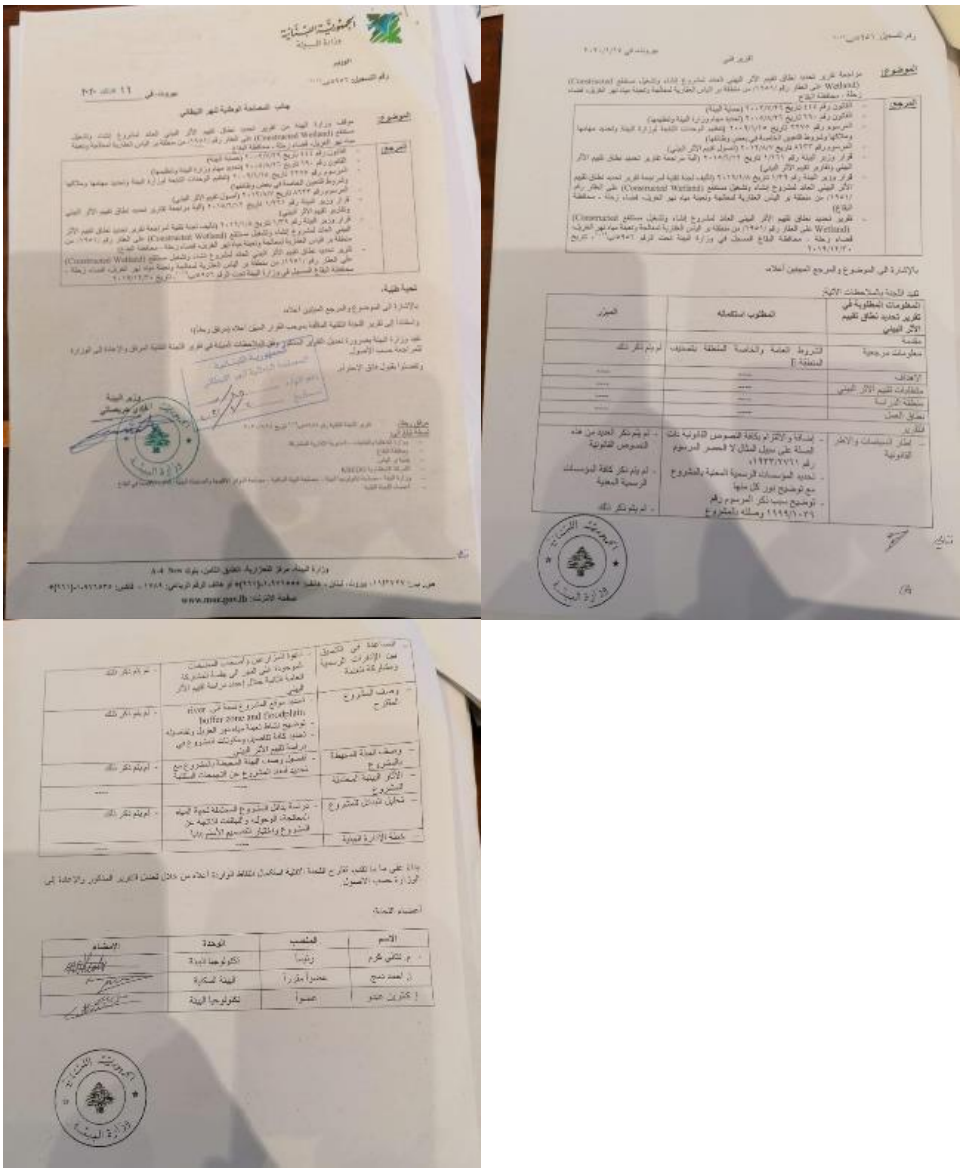
Below has been done for Jordan and Lebanon. Although no EIA was required by law in Jordan, an accredited consultant in Jordan conducting risks screening and impact assessments to comply to AF requirements. Besides that an accredited consultant firm in Lebanon conducting risks screening and impact assessments to comply to AF requirements.

Table 36: Summary of the EIA Procedures in Jordan and Lebanon

Stage	Activity
Initial Filing and Screening	The Project Proponent completes a Project Information Form (PIF) of the intended project and submits it to the Ministry of Environment for screening. An Inter-ministerial Central Licensing Committee reviews the PIF, and after conducting site surveys determines if the project is classified as: Category I projects for which an EIA report is required Category II projects for which an initial EIA is only required Category III for which no environment analysis is required
Scoping	The Ministry issues legally binding guidance on the Scope of the Assessment Proponent prepares a ToR, after a mandatory public consultation. An Inter-Ministerial Technical Review Committee (TRC) reviews and approves the ToR. Accredited consulting entity commences with EIA.

Table 37: EIAs completed as required by national law

Output / activity	National EIA requirements and procedure	Outcome
None	According to Decree No. 8633,2012 of MoE, the following steps were taken: -A screening form for the project was submitted -A public consultation was held on December 18th, 2019 -A scoping report was submitted to MoE on December 30th, 2019. -The EIA report is the final step of the EIA process. It was submitted on January 13th, 2020, following the reply of MoE on scoping report(see reply letter below) -The EIA report is not relevant anymore because the wetlands are not part of the proposal anymore -Amended output 3.4 was screened with the MoE and was found to require an EIA study which will be prepared and submitted for MoE approval	Environmental Management and Monitoring Plan for the risks and impacts identified in EIA.



Principle 2: *Access and Equity*.

Screening result: no potential risk

Explanation: All project beneficiaries (i.e. population; groups) have been mapped (see overview table 6) for each project activity / output. Community consultations and focus groups discussions have been conducted per beneficiary group to identify possible rivals, disputants and concerns related to equal access of project benefits. In that way, equal allocation and distribution of project / programme benefits will be ensured during project execution. Moreover, there will be neither discrimination nor favouritism in accessing project/programme benefits. Project benefits will be allocated and distributed equally through a

participatory process and through joint decision-making using water user and agriculture associations. Component 2 has been designed to facilitate this process, including awareness raising and capacity building of communities and vulnerable groups to operate, maintain and replicate proposed activities under component 3. Under component 1, various groups will be equally involved, in assessment and planning processes (if needed through quotas).

Principle 3: *Marginalized and Vulnerable Groups*.
Screening result: no potential risk
Explanation: all project beneficiaries (i.e. population; groups), including marginalised and vulnerable groups have been mapped for each project activity / output (see overview table 6). Desk research, expert consultations and community consultations and focus group discussions have been used (see Part II.I and Annex 3) to identify possible risks / adverse impacts of project activities on marginalized and vulnerable beneficiary groups (i.e. specific needs, limitations, constraints and requirements of groups). Disaggregated data at the district and municipal and activity beneficiary level has been used to identify and quantify marginalized and vulnerable groups. Also, UNHCR has been consulted to to specifically identify potential risks and needs of marginalised and vulnerable groups.

Principle 4: *Human Rights*.
Screening result: no potential risk
Explanation: during project preparation and execution, international human rights are respected and where applicable, promoted. During project preparation, possible human rights issues have been identified by assessing whether Jordan and Lebanon are cited in any Human Rights Council Special Procedures, and to confirm and understand possible issues through consultations with 'experts.' Communities have also been consulted about possible human rights issues with the purpose of design activities appropriately.

OHCHR has been consulted and mentioned that both Jordan and Lebanon have both not ratified core Human right CMW - International Convention on the Protection of the Rights of All Migrant Workers and Members of Their Families. Therefore, the project needs to ensure DPs and Lebanese and all other groups have equal access to work options and are equally treated / rewarded. This will be done through participatory planning process and by included standard clauses in all contract with contractors ensuring all beneficiary groups will have equal access and opportunities. Moreover, awareness about this will be raised through poster, explaining rights and grievance options.

Principle 5: *Gender Equality and Women's Empowerment.*
Screening result: no potential risk
Explanation: the project ensures that gender equality and women's and youth empowerment is ensured for all project activities. During project preparation, this has been done through detailed stakeholder mapping (see also principle 3) including identification of specific needs, limitations, constraints and requirements of women and youth. UN Women and UNICEF have also been consulted to specifically identify potential risks and needs of women. A specific 'gender' approach and baseline section has been developed based on a gender assessment. See annex 5. In this section, the legal and regulatory context with respect to gender equality and women's empowerment in which the project takes place has been analysed, as well as cultural, traditional and religious context. Arrangements that ensure equal participation in project activities and consultations and equal access to benefits have also been identified in the gender assessment (approach and baseline).

Principle 6: *Core Labour Rights*.
Screening result: no potential risk
Explanation: the project ensures that all project activities meet the core labour rights and that possible risks have been identified and if existing, prevented or mitigated. During project preparation, this was done by identifying possible compliance issues by analysing if Jordan and Lebanon ratified the conventions, to confirm and understand these possible issues through consultations with ILO and by describing how the project will address possible compliance issues. Communities have also been consulted about possible labour issues that could arise while executing project activities with the purpose of design activities appropriately.

ILO identified the following:

- Agriculture: Lebanon and Jordan have both not ratified C129 - Labour Inspection (Agriculture) Convention, 1969 (No. 129)
- Construction: Lebanon and Jordan have both not ratified C167 - Safety and Health in Construction Convention, 1988 (No. 167)
- Migrant workers: Lebanon and Jordan have both not ratified C143 - Migrant Workers (Supplementary Provisions) Convention, 1975 (No. 143)
- Women: Lebanon and Jordan have both not ratified: P089 - Protocol of 1990 to the Night Work (Women) Convention (Revised), 1948

Potential issue / risks:
- Convention 81 – labour inspection convention. Although ratified there is limited inspection capacity
- Increase in child labour (because refugees often work with whole family)
- Safety / harassment issues for women

Figures:
- Not many women in construction, but many in agriculture

Improvements and projects:
- Collective Bargaining Agreement (CBA) by 2019
- Shawish (mediator) protect wage of Syrian refugees
- Flexible work permit for Syrian refugees (not dependent on one employer)

Therefore, UN-Habitat need to ensure all contracts include standard clauses to avoid any risks regarding above and that safety measures are taken and inspections conducted.

Principle 7: *Indigenous Peoples*.
Screening result: no potential risk
Explanation: the project ensures that project activities 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 mitigated / prevented. During project preparation, the project determined that no indigenous people are present in the project / programme target areas.This has been determined through stakeholder mapping (through desk research and expert and community consultations. Although Some Bedouins are now official Lebanese and Jordanians, no indigenous groups have been identified in target areas. Besides that, it has been analyzed if Jordan and Lebanon ratified the ILO Convention 169 and other applicable international instruments relating to indigenous peoples.

Principle 8: *Involuntary Resettlement*.
Screening result: no potential risk
Explanation: the project determined that no physical or economic displacement will take place due to the project/programme. This has been determined by mapping project target sites land ownership (private, public) and land use, also informally, and through consulting communities / users on the possible risk of resettlement and to get agreement on proposed interventions (i.e. no interventions will take place without the consent of inhabitants in the targeted areas). Land owners, private or public, have agreed with using their land for project activities. Regarding the construction of irrigation channels, these will also take place on public land and or in consent with the land owners, especially farmers, through the water use and agriculture associations. The other proposed project activities all take place in buildings or on the treatment plants premises. Public hearings and consultation in the target areas did not identify any concerns related to resettlement.

Principle 9: *Protection of Natural Habitats*.
Screening result: no potential risk
Explanation: the project ensures that no unjustified conversion or degradation of critical natural habitats will take place because of project activities. During project preparation, it has been checked if any critical natural habitats exist in the target location, including their location, characteristics and critical value (i.e. legal protection status, common knowledge or traditional knowledge), as well as possible negative impacts on these due to project activities. This has been done by checking IUCN Red list and by consulting IUCN (regional office)

Principle 10: *Conservation of Biological Diversity*.
Screening result: no potential risk

Explanation: the project ensures that any significant or unjustified reduction or loss of biological diversity because of project activities will be avoided. During project preparation, 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).

Principle 11: *Climate Change*.
Screening result: no potential risk
Explanation: the project will ensure that project activities will not result in any significant or unjustified increase in greenhouse gas emissions or other drivers of climate change.

Table 38: Identification of possible increase of greenhouse gases per project activity

Output / activity	Activity that may increase greenhouse gases	Possible increase in greenhouse gases
3.5. Efficient treatment and reuse of wastewater in Jordan	Energy use for some pumping	Although very limited, energy use could be increased because of pumping of water from WWTP to farm lands. To compensate for this, PV will be installed at the plants

Principle 12: *Pollution Prevention and Resource Efficiency*.
Screening result: there may be pollution risks due to treatment practices at WWTPs
Explanation: the project aims to maximize energy efficiency and minimizing material resource and prevents waste and pollution due to project activities through analysis of possible risks of inefficiencies in energy and material resource use and waste and pollution risks of each activity – which has been done during project preparation. Irrigation of waste water from the Zahle WWTP for instance has been designed to serve farmers through a gravity system. However, these may be some risks of on-plant accidental spills, overflows, seepages and discharges of wastewater treated, which may contaminate soil, groundwater or surface water from WWTP.

Table 39: Identification of possible pollution risks per project activity

Output / activity	Possible pollution risks	Description possible health risks / impacts
3.4. Efficient treatment and reuse of wastewater in Lebanon	Pollution. Contamination of soil, groundwater or surface water	On-plant accidental spills, overflows, seepages and discharges of wastewater treatment may contaminate soil, groundwater or surface water from WWTP
3.5. Efficient treatment and reuse of wastewater in Jordan		

Principle 13: *Public Health*.
Screening result: there may be potential health risks due to used water
Explanation: the project will ensure that potentially significant negative impacts on public health are avoided. To avoid potential negative health impacts for project activities and other activities safety signs and equipment will be provided in line with core labour rights (155 and 187). Although the project intends to improve the quality already used for irrigation, water quality monitoring will take place. The same accounts for the rainwater harvesting and greywater treatment and reuse interventions.

Table 40: Identification of possible health risks per project activity

Output / activity	Possible health risks	Description possible health risks / impacts
3.1. Rooftop rainwater harvesting in Lebanon	Safe water	Water quality from RWH and GWTR systems may not comply to standards
3.2. Rooftop rainwater harvesting in Jordan		
3.3. Greywater treatment and reuse in Jordan		
3.4. Efficient treatment and reuse of wastewater in Lebanon		Treated waste water used for irrigation may not comply to quality standards / unmonitored

3.5. Efficient treatment and reuse of wastewater in Jordan	Improved water (safe water)	irrigation water may reduce quality of crops. Also covid-19 may be detected in water entering the treatment facility

Principle 14: *Physical and Cultural Heritage*.
Screening result: no risk
Explanation: the project ensures that the alteration, damage, or removal of any physical cultural resources, cultural sites, and sites with unique natural values recognized as such at the community, national or international level due to project activities will be avoided. During project preparation, It has been checked if physical or cultural heritage sites are present or near project sites, as well as possible risks of impacts on these due to project activities. UNESCO listed Heritage sites in target area:[123]Anjar has been identified as a heritage site in Lebanon (in the district of Zahle). However, this is not in the target areas.

Principle 15: *Lands and Soil Conservation*.
Screening result: no risks
Explanation: The project ensures no negative impacts lands and soil conservation will result from project activities. All proposed project activities aim to enhance sustainable land and soil use, especially for agriculture use. No major excavations will take place.

1.3. Environmental and social impact assessment

For an overview of project activities' potential risks and impact assessment result against the 15 AF principles, see table below.

Table 41: Overview of project activities' screening and assessment results against the 15 AF risk areas / principles

Output / activities	Potential risk / impact	Impact assessment
3.1. Rooftop rainwater harvesting in Lebanon	Safe water: Water quality from RWH and GWTR systems does not comply to standards	~~20~~ 10 RWH systems with following direct beneficiaries: ~~8,753~~16,360 (visitors, students)
3.2. Rooftop rainwater harvesting in Jordan		6~~486~~ RWH systems with following direct beneficiaries: ~~52,855~~42,284
3.3. Greywater treatment and reuse in Jordan		40 GWRT with following direct beneficiaries: 39,582 (same as under output 3.1.)
3.4. Efficient treatment and reuse of wastewater in Lebanon	Improved water (safe water): Water used for irrigation does not comply to quality standards / unmonitored irrigation water may reduce quality of crops. Also covid-19 may be detected in water entering the treatment facility Pollution. On-plant accidental spills, overflows, seepages and discharges of wastewater treatment may contaminate soil, groundwater or surface water from WWTP	Output 3.4. The Zahle WWTP treats ~~18~~20,000m^3 and irrigate ~~110-116~~800 hectares of farmland
3.5. Efficient treatment and reuse of wastewater in Jordan		Output 3.5.1. Maerad WWTP will store 2~~3~~000m^3 of water and irrigate 60 dunum of farmland Output 3.5.2. Al Kaider WWTP will store 5~~20~~00m^3 of water and irrigate 60 dunum of farmland Output 3.5.3. Mafraq WWTP will irrigate 100 dunum of farmland Spills, overflows and seepages are at plant level and can be contained there

Detailed country specific ESIA and ESMP for the proposed project activities in Jordan and Lebanon can be found on the ROAS website

1.4. Environmental and social management plan

Content:
- ☐ Allocated roles and responsibilities environmental and social risk management / implement of the ESMP
- ☐ Opportunities for adaptive management

[123] https://whc.unesco.org/en/list/&order=country#alphaG

- ☐ Arrangements to supervise executing entities for implementation of ESMP
- ☐ Budget provision to manage environmental and social risks / implement of the ESMP
- ☐ Measures to avoid, minimize, or mitigate potential risks
- ☐ Risks monitoring system / indicators
- ☐ Grievance mechanism

Allocated roles and responsibilities for environmental and social risk management / implementation of the ESMP

The Regional Project Supervision Unit will be responsible for environmental and social risks management, including implementation of the Project ESMP. An AF and UN-H policies and reporting compliance expert will be part of the RPSU. This expert will also supervise Project Execution Entities on the implementation of the Project ESMP. Guidelines showing how to comply to the AF ESP and GP will be shared with all execution entities and they will be guided on process, including monitoring. Also, a detailed action plan to comply to ESP and GP will be developed during the project inception phase.

A Safeguarding system compliance expert will also be part of the RPSU. Monitoring staff part of the RPSU will require having expertise in social risk management and be familiar with the AF safeguarding system. The RPSU will be backstopped by UN-Habitat HQ, with experts on climate change, human rights, environmental and social risks managements and gender policies.

In both Lebanon and Jordan government stakeholders responsible for compliance to national environmental and social policies and standards will be part of the Regional- and National-level Steering Committees, as well as government gender focal points.

This ESMP will allow country-specific management of the potential risks and impacts identified under in country-specific ESIA and ESMP reports (see link at beginning of this document). It is worth noting that an MoU is needed with Litani River Authority (LRA) for the success of the wastewater activities (output 3.2.4).

All project-related ToR's and contracts will include clauses stating contractors will need to comply to the AF ESP, especially principle 1 (law), 4 (human rights), 5 (gender) and 6 and 13 (labour and safety) and the AF GP. This includes:

- ☐ Principle 1: References to standards and laws to which the activity will need to comply will be included in all legal agreements with all sub-contractors, including steps and responsibilities for compliance.
- ☐ Principle 4: References to relevant Humans rights declarations will be included in all legal agreements with all sub-contractors.
- ☐ Principle 5: Reference to relevant gender policies
- ☐ Principe 6: Employment and working conditions following ILO standards will be included in legal agreements with all sub-contractors.
- ☐ Principle 13: Ensure that ICSC international health and safety standards are clearly accessible and understood. e.g. by putting clearly visible signs detailing health and safety standards to be located at projects sites and by supplying protective equipment.

Opportunities for adaptive management

When changes in project activities or additional activities are required, these will need to go through a new risks screening and impact assessment process in compliance with AF, UN-habitat and national policies and standards. When this is required, this will be led by the RPSU and the Regional-level Project Steering Committee would need to approve the changes. As for opportunities, when allocated budgets for e.g. installing RWH systems allow targeted additional buildings for installing RWH systems, this would be possible following above process. Possible additional target buildings have already been identified.

Arrangements to supervise executing entities for implementation of ESMP

Table 42: Capacity of potential executing entities to carry-out gender responsive activities

Potential executing entity	Skills and expertise to provide gender mainstreaming inputs	Specific requirements execution entities for compliance	Capacity building needs

UNICEF (Lebanon and Jordan)	Yes (UN core value)	Appoint ESP a compliance and gender focal point Capacity to comply to the AF ESP and implementation of the ESMP guided by UN-Habitat Capacity to comply to the AF GP (see annex 5).	Awareness on requirements Share guidelines for execution entities to comply and to ensure 'opportunities' are identified and exploited
UN-ESCWA (Lebanon)	Yes (UN core value)		
Litany River Authorities (Lebanon)	Limited (as government entity)	Appoint ESP a compliance and gender focal point Capacity to comply to the AF ESP and implementation of the ESMP guided by UN-Habitat Capacity to comply to the AF GP (see annex 5).	Awareness on requirements Share guidelines for execution entities to comply and to ensure 'opportunities' are identified and exploited Support development baseline and approach before project start + reporting requirements
Bekaa Water Establishment (Lebanon)			
Lebanese Agriculture Research Institute (Lebanon)			
WAJ / Yarmouk (Jordan)			
BADIA FUND (Jordan)			
Companies / consultancy firms	Limited (as company)	Appoint ESP a compliance and gender focal point Capacity to comply to the AF ESP and implementation of the ESMP guided by UN-Habitat Capacity to comply to the AF GP (see annex 5).	
JOHUD (Jordan)	Some (as NGO / institute)		
Permaculture Research Institute (Jordan)			

Budget provision to manage environmental and social risks / implement of the ESMP

Dedicated safeguard compliance staff time is allocated under project execution fees for USD 42,000. Also, dedicated AF ESP and GP compliance staff time is allocated under MIE management fee for ROAS of USD 114,000. These persons will ensure compliance and develop ESP and GP compliance guidelines and action plans for execution entities and guide these execution entities through the process, including baselines and reporting requirements. Besides that measures are budgeted, through the execution entities, to supervise and monitoring proposed project activities, including e.g. water sampling, remote monitoring system of RWH and GWTR systems, etc. Costs for risks mitigation measures are integrated in the budget, including e.g. PV installation and water quality monitoring.

Measures to avoid, minimize, or mitigate potential risks

Table 43: Overview of project activities' screening and assessment results against the 15 AF risk areas / principles, including measures to avoid or mitigate risks / impacts

Project outputs / activities	Potential risk / impact	Impact assessment	Measures to avoid or mitigate risks / impacts	M & E arrangements	
				Indicator and method	Responsibility and frequency
3.1. Rooftop rainwater harvesting in Lebanon	Principle 13: Safe water: Water quality from RWH and GWTR systems does not comply to standards	~~20~~ 10 RWH systems and 1 showroom with following direct beneficiaries: ~~8,753~~58,912 (visitors, students)	Rainwater collected will be treated using sand and carbon filter, a micro filter, and chlorine. This will ensure water quality compliance. Note that tap water is not used for drinking or cooking. Water and roofs will be regularly monitored, especially at the start of the rainy season; Filter will be changed annually, as per supplier recommendation. The chlorine tank should not be empty so there will be no pumping of air that impacts water quality; Students and building staff will be made aware (through curriculum) of requirements of using water + involved in operation and maintenance; Remote monitoring systems will be installed	Water quality monitoring; Awareness raising campaign; O & M (training) reports with attendance lists and photos; checking of filters and chlorine tank Water quality monitoring; Awareness raising campaign; O & M (training) reports with attendance lists and photos; checking of filters and chlorine tank; Remote monitoring systems will be installed	UN-H in cooperation with execution entities / government entities and building management Check (compliance to tap water quality standards) – at least every 3 months Check filters and chlorine tank - annually
3.2. Rooftop rainwater harvesting in Jordan		~~64~~86 RWH systems with following direct beneficiaries: ~~52,855~~42,284 (visitors, students)			
3.3. Greywater treatment and reuse in Jordan		40 GWRT with following direct beneficiaries: 39,582 (same as under output 3.1.)			
3.4. Efficient treatment and reuse of wastewater in Lebanon	Principle 13: Improved water (safe water): Water used for irrigation does not comply to quality standards / unmonitored irrigation water may reduce quality of crops. also covid-19 may be detected in water entering the treatment facility Principle 12: Pollution. On-plant accidental spills, overflows, seepages and discharges of wastewater treatment may contaminate soil, groundwater or surface water from WWTP	Output 3.4. The Zahle WWTP treats ~~18~~20,000m^3 and irrigate 1~~5~~8000~~0~~ hectares of farmland	Implementation of environmental mitigation plan prepared as part of the EIA study Although the project intervention aims to increase the quality of water for irrigation, regular testing of water quality is required, also for covid-19 and irrigation will only begin after testing; Farmers will be made aware of requirements for use + involved in operation and maintenance; Carry out regular inspections and routine tests to avoid spills, overflows, seepages and discharge of low-quality water (see also water quality testing below); include detailed risks mitigation measures identified in country-specific ESIA-ESMP reports in construction, operation and maintenance plans;	Water quality monitoring of the effluent from the WWTP. The level of treatment is tertiary. This needs to be checked on a regular basis. Monitoring of wastewater handling and possible spills, overflows and seepages. Construction and O & M report addressing above	UN-H in cooperation with execution entities / government entities Quality check (compliance with FAO guidelines for irrigation) – monthly Check standards for water quality, treatment and construction - monthly
3.5. Efficient treatment and reuse of wastewater in Jordan		Output 3.5.1. Maerad WWTP will store 2000~~3000~~ m^3 of water and irrigate 60 dunum of farmland Output 3.5.2. Al Kaider WWTP will store ~~5~~20000m^3 of water and irrigate 60 dunum of farmland Output 3.5.3. Mafraq WWTP will irrigate 100 dunum of farmland Spills, overflows and seepages are at plant level and can be contained there			

* For more details see country-specific ESIA reports

Risks monitoring system / indicators
The environmental and social risks management approach includes monitoring of potential risks and implementation of risks mitigation measures. This monitoring program commensurate with project activities and will report on the monitoring results to the Fund in the mid-term, annual, and terminal performance reports. Monitoring will be done to ensure that actions are taken in a timely manner and to determine if actions are appropriately mitigating the risk / impact or if they need to be modified in order to achieve the intended outcome. Annual reporting will include information about the status of implementation of this ESMP, including those measures required to avoid, minimize, or mitigate environmental and social risks. The reports shall also include, if necessary, a description of any corrective actions that are deemed necessary.

The Regional Project Supervision Unit will be responsibility for environmental and social risks management, including monitoring of the implementation of the Project ESMP. An AF and UN-H policies and reporting compliance expert will be part of the RPSU. A Safeguarding system compliance expert will also be part of the RPSU. Monitoring staff part of the RPSU will require having expertise in social risk management and be familiar with the AF safeguarding system. Gender specific indicators and targets have been developed as shown in the results framework and annex 4. Specific budgets for for risks monitoring are covered by M & E staff time under the execution fee (USD 63,000 total).

Table 44: monitoring arrangements for general risks management

Action	Indicator and method	Responsibility and frequency
Monitoring of capacity execution entities to comply	Guidelines and action plans shared Monitoring reports comply to requirements	RPSU; within half a year from inception RPSU; when reports are required
Implementation of grievance mechanism	Grievance mechanism information is at target locations (buildings, etc.) Grievance mechanism information is shown on UN-Habitat project website	RPSU in coordination with execution entities; within half a year from inception RPSU in coordination with execution entities; within half a year from inception
Monitoring of measures to avoid or mitigate risks / impacts per output	See table 42 above	RPSU in coordination with execution entities; when reports are required

Grievance mechanism
UN-Habitat in coordination with the execution entities will implement a grievance mechanism in the target areas, which will allow an accessible, transparent, fair and effective means of communicating if there are any concerns regarding project design and implementation. Project employees, and people benefitting / affected by the project will be made aware of the grievance mechanism for any criticism or complaint of an activity.

This mechanism considers the special needs of different groups as well as gender considerations and potential environmental and social risks, especially human rights (as shown on posters). A combination of mailboxes (at community / building level) and telephoning options offer an immediate way for employees and people affected by the project to safely express their concerns. The options will allow local languages and offer the opportunity for and people affected by the project to complain or provide suggestions on how to improve project design and implementation, which will be reviewed and taken up by the project implementation team.

Project staff and execution entities will be made aware of the procedures for receiving messages and on the reporting of any grievances. In addition, monitoring activities allow project participants to voice their opinions or complaints as they may see fit.

The address and e-mail address of the Adaptation Fund will also be made public (i.e. project website, Facebook and mailbox) for anyone to raise concerns regarding the project. For country-specifics recommendations regarding the grievance mechanisms, see country specific ESIA-ESMPs.

ANNEX 5: Gender and youth assessment (approach and baseline)

Purpose

The purpose of this specific 'gender assessment' is to demonstrate (in an overview) how this project will comply to the AF GP. A gender approach and data baseline has been established, which is necessary at the project start against which implementation progress and results can be measured.

In line with UN-Habitat's ESSP, the approach includes the identification and of promotion of economic, social and environmental benefits and opportunities for women and youth for each project activity (which can be seen as an additional safeguard area).

During project preparation a 'gender assessment' has been conducted to identify potential project gender equality and women's and youth empowerment issues, but also opportunities. The outcomes are summarized below, as well as arrangements that will be taken during project implementation to comply to the AF GP, including to show how the project contributes to improving gender equality, the empowerment of women and youth and the project interventions' suitability to meet the adaptation needs of targeted women and men and youth.

Methodology

During the project preparation phase, potential gender equality and women's and youth empowerment challenges and opportunities have been identified through initial data analysis / desk research, surveys and focus group discussions with women, youth and other groups. Through these methods, specific women and youth needs and perceptions were identified, as well as potential gender-related risks and impacts, including possible concerns regarding proposed project activities.

Specific considerations and phases

1. Determinants for gender-responsive stakeholder consultations

Table 45: Stakeholders consulted to develop gender approach

Type of stakeholder	Specific stakeholder
National government	Lebanon: Ministry of Social Affairs (MoSa) – to be invited to the SC Jordan: Ministry of Social Development (MoSD) - to be invited to the SC
UN agencies	UN Women UNICEF
Community level	Community consultations and focus group discussions with women and youth

*See also part II.I

2. Initial Gender Assessment

a. Data baseline – overview of disaggregated data (beneficiaries) in target areas.

Table 46: Data baseline – women and youth

Project outputs	Lebanon				Jordan			
	Direct		Indirect		Direct		Indirect	
	Women	Youth	Women	Youth	Women	Youth	Women	Youth
1.1.	192	72	217,475	23,733				
1.2.	96	36	84,815	9,256				
1.3.					180	67	415,44	259,107
2.1.	~~27,689~~29,658	~~2,950~~3,160	154,582	16,548				
2.2.					~~26,420~~21,136	~~19,385~~15,508	~~415,443~~32,352	~~259,107~~207,285
2.3					21,940	15,646		
2.4.	416	85	94,705	10,140				
2.5					5	2	5,342	2,972
2.6.	864	93	94,705	10,140				
2.7.1					200	150	4528	2474
2.7.2.					~~180~~80	~~135~~120	~~480~~814	~~810~~498
2.8.					150	45	11,500	60
2.9	205	182	700	500				

3.1.	~~27,689~~29,658	~~2,950~~3,160	154,582	16,548				
3.2.					~~21,136~~26,420	~~15,508~~19,385	~~332,352~~415,44	~~207,285~~259,107
3.3.					21,940	15,646		
3.4.	~~2,013~~8,407	~~216~~902	94,705	10,140				
2.4.	1,184	127	35,514	3,802				
2.5.1					31	20	3,789	1,980
2.5.2					31	20	739	494
2.5.3					35	20	814	498
3.6.	~~2,293~~	~~540~~	~~: 130,219~~	~~13,941~~				
3.7.1					62	40	4,528	2,474
3.7.2					~~25~~35	~~15~~20	~~150~~814	~~90~~498
3.8.					150	45	11,500	60
3.9	205	182	700	500				
4.1.	80	30	Whole Mena region					
4.2.	80	30						
4.3.	80	30						
Total	80	30						

b. Context:

Table 47: analysis of gender-specific legal and cultural / religious context

	Jordan	Lebanon
Analysis of legal status of women	Jordan has seen important changes with regards to gender equality over the last decades. Work on women's rights reached new levels following the ratification of the Convention on the Elimination of All Forms of Discrimination against Women (CEDAW) in 1992 and the establishment of the Jordanian National Commission for women (JNCW) in the same year. The indicators for women's education and health show notable improvements. However, women's participation in the formal labour market is low. Moreover, women are still not equal to men before the law. There have been several reforms of the Personal Status Law (the latest reform took place in 2010). Violence against women is not sufficiently addressed. The gender gap in politics persists despite introduced quotas for women.[124]	Article 8 of the Lebanese Constitution asserts the equality of rights and duties of all citizens, regardless of gender.[1] Lebanon ratified the Convention on the Elimination of All forms of Discrimination against Women (CEDAW) in 1997 with reservations to Article 9(2), regarding nationality; several subparagraphs of Article 16(1), related to personal status laws; and Article 29(1), on the settlement of disputes.[2] Lebanon has published CEDAW in the official Gazette, giving it primacy over national laws, one of the few Arab countries to do so. The country has not yet ratified the Optional Protocol.[125]
Analysis of cultural/religious status of women	Country falls into group 5 countries: has low equality in HDI achievements between women and men: absolute deviation from gender parity greater than 10 percent (HDI 95 out of 189) and scores 'high' on level of discrimination of women on the OECD gender index (with access to resources, civil liberties, and son bias).[126]	Country falls into group 5 countries: has low equality in HDI achievements between women and men: absolute deviation from gender parity greater than 10 percent (HDI 80 out of 189)[127] and scores 'high' on level of discrimination of women on the OECD gender index (with especially access to resources being an issue).[128]

c. Differentiated climate change impacts on men and women and their differentiated capacities do adopt to these, gender division of labour and gender-based power structures.

Table 48: Differentiated climate change impacts on men and women

Country	Sector / Livelihood relevant to the project	Climate change impact	Gender and youth equality and empowerment issues, incl. specific Vulnerabilities / barriers to adapt	Capacity to adapt and opportunities for promoting a 'women' and 'youth' as agents of change

[124] https://www.genderindex.org/country/jordan/
[125] https://www.genderindex.org/country/lebanon/
[126] https://www.genderindex.org/country/jordan/
[127] http://hdr.undp.org/en/composite/GDI
[128] https://www.genderindex.org/country/lebanon/

Lebanon	Agriculture	Drought / less work	High dependency on agriculture sector for income; cultural and traditional barriers to negotiate salary and work conditions	Women organization
	Water (domestic)	Drought / less work	Time consuming and involves safety risk (including harassment) to collect water and high financial burden to get water	Involve women and youth in water harvesting activities
Jordan	Agriculture	Drought / less work	High dependency on agriculture sector for income; cultural and tranditional barriers to negotiate salary and work conditions	Women organization
	Water (domestic)	Drought / less work	Time consuming to collect water and high financial burden to get water. Physical and psychological stress to do house work (cleaning, laundry, etc.) once a week and mostly at night.	Collect water at home (through water harvesting)

d. Capacity gaps affecting GP compliance

Table 49: Capacity of potential executing entities to carry-out gender responsive activities.

Potential executing entity	Skills and expertise to provide gender mainstreaming inputs	Specific requirements execution entities for compliance	Capacity building needs
UNICEF (Lebanon and Jordan)	Yes (UN core value)	Appoint gender focal point Target women and youth for awareness and capacity building activities Identity specific women and youth needs in roll-out project activities Where realistic, use quota targets for women and youth participation in project activities Highlight specific gender and youth considerations in knowledge management Have a participatory (women and youth monitoring system)	Awareness on requirements Share guidelines for execution entities to comply
UN-ESCWA (Lebanon)	Yes (UN core value)		
Litany River Authorities (Lebanon)	Limited (as government entity)	Appoint gender focal point Target women and youth for awareness and capacity building activities Identity specific women and youth needs in roll-out project activities Where realistic, use quota targets for women and youth participation in project activities Have a participatory (women and youth monitoring system)	Awareness on requirements Share guidelines for execution entities to comply and to ensure 'opportunities' are identified and exploited Develop baseline and approach before project start + report
Bekaa Water Establishment (Lebanon)			
Lebanese Agriculture Research Institute (Lebanon)			
WAJ / Yarmouk (Jordan)			
BADIA FUND (Jordan)			
Companies / consultancy firms	Limited (as company)	Appoint gender focal point Target women and youth for awareness and capacity building activities Identity specific women and youth needs in roll-out project activities Where realistic, use quota targets for women and youth participation in project activities Highlight specific gender and youth considerations in knowledge management Have a participatory (women and youth monitoring system)	
JOHUD (Jordan)	Some (as NGO / institute)		
Permaculture Research Institute (Jordan)			

e. Opportunities for promoting a ‘women’ and ‘youth’ as agents of change

Through community-level consultations, it was found that women in Jordan and Lebanon (from both host communities and DPs) have knowledge regarding the water use and (urban) farming. The project aims to utilizing women’s traditional knowledge by targeting women in community level skill building and trainings. Enhancing women and youth’s capacities for efficient water harvesting and grey water treatment and re-use will help address their vulnerabilities to water scarcity. In Jordan, permaculture training would secure a source of livelihoods for women. Opportunities include:

- ☐ Have women, youth and Syrians participate in assessment and planning processes + monitoring
- ☐ Include women and youth considerations / roles in strategies and plans
- ☐ Target and strengthen women organizations
- ☐ Women to be involved with O & M RWH in buildings
- ☐ Youth to work with women on O & M RWH in buildings, esp. schools
- ☐ Women and Youth to be involved with GWTR in mosques and schools
- ☐ Women to be involved in permaculture activities as consultations have shown that they see it as a source of income and can develop business cases.
- ☐ Youth to be target and if possible, lead awareness raising campaigns on adaptation to water scarcity.

3. Project planning and design.

Table 50: Gender baseline, goals and activities. A detailed action plan will be developed at inception phase

Project outputs	Disaggregated beneficiaries, gender specific issues and needs / baseline	Key gender goals (to improve equality)	Entry points (to integrate gender considerations / empower women / youth)	Suitable interventions to meet specific needs and built on women and youth skills and knowledge	Additional activities needed to ensure gender perspective, incl. potential risk mitigation measures	Specific 'gender' output Indicator	Specific 'gender' targets	Budget required and allocated
1.1. 1.2. 1.3.	Limited participation women and youth and roles are not specified in plans	Women and youth to be involved in assessment and planning	Women and youth groups	Involve women and youth groups and have specific gender considerations in plans	Use quota if needed Check women and youth considerations in plans	% women and youth participation in assessment and planning Women and youth considerations in plans	Women: 40 % Youth: 15 % Specific mentioning	A dedicated safeguard compliance staff time is allocated under project execution fees for USD 42,000 Dedicated AF ESP and GP compliance staff time is allocated under MIE management fee for ROAS of USD 114,000 These persons will ensure compliance and develop ESP and
2.1. 2.2. 2.3	Women and youth should get a chance to be involved with RWH and GWTR activities	Involve women and youth in O & M and replication options; Youth to be involved in awareness	Women and / or youth focus point / lead in buildings		Follow-up on selected focal point	Focal point identified % youth participating in awareness campaigns	1 per building Youth: 30 %	
2.6. 2.7.	Farmers and workers, incl. Syrians and youth are targeted	Ensure Syrians and Lebanese are equally involved	Workers participate in water associations	Youth to be targeted for modern irrigation technique use capacity building	Use quota if needed	% Syrians and youth participation	Syrian: 15 % Youth: 30 %	
2.8.	Students are targeted of	Females to particip	Female considerations in	Female students to work with	Follow-up on	% female students	Female: 60 %	

	which most female	ate in activities and curriculum	knowledge management	Syrian women	cooperation			GP compliance guidelines for execution entities (with support from UN-HQ)
2.9	Students are targeted of which most female	Females to participate in activities and curriculum	Female considerations in knowledge management	Female students to work with Syrian women	Follow-up on cooperation	% female students	Female: 51 %	
3.1. 3.2. 3.3.	Women and youth need to be involved with RWH and GWTR	Involve women and youth in O & M of systems	Women and / or youth focus point / lead in buildings		Follow-up on selected focal point	Focal point identified	1 per building	
~~3.6.~~ 3.7.	Farmers and workers, incl. Syrians and youth are targeted	Ensure Syrians and Lebanese are equally involved	Workers participate, if possible, in project works	Youth to be targeted for modern irrigation technique establishment	Use quota if needed	% Syrians and youth participation	Syrian: 15 % Youth: 30 %	
3.8.	Employees could be female	Select (partially) female workers	Selection process		Follow-up on selection process	% female employees	50 %	
3.9	Employees 50% of which areto be females	Select (partially) female workers	Selection process	Youth to be targeted for rain water harvesting and permaculture techniques establishment	Follow-up on selection process	% female employees	50 %	
4.1.								

4.2.	Limited involvement women	Women to participate in meetings	Quota / Steering committee	Have specific gender considerations in knowledge management	Use quota if needed	Women and youth considerations in KM	Specific mentioning	
4.3.	Women roles and youth are not specified in plans and knowledge management	Women and youth roles to be identified	Consider gender and youth issues and needs	Have specific gender considerations in knowledge management	Check women and youth considerations in plans	Women and youth considerations in plans / KM	Specific mentioning	

4. **Project implementation**
   UN-Habitat aims to have a gender responsive and adaptable management approach in place which, when needed, allows adjustment based on learning from earlier decisions and interventions and received feedback. This is done through having gender expertise and focal points in place, whom should identify challenges, barriers or restrictions that arise during project/programme implementation, which might hinder the equal participation of men and women in activities.

   Capacities of execution entities will be built so they are able to provide gender mainstreaming inputs and identify any challenges that arise during project/programme implementation, which might hinder the equal participation of men and women in activities. This requires appointing a gender focal point and having quota targets for women and youth participation in project activities. Gender focal points from the government will be part of the steering committees.

   The project Grievance mechanism established will be capable to accept grievances and complaints specifically related to gender equality and women's empowerment

5. **Performance Monitoring and Evaluation**
   The gender responsive management approach includes gender responsive monitoring and evaluation, which is participatory and where 'gender disaggregated data' will be collected and analysed. Where possible, women and youth will be encouraged to participate in monitoring activities.

6. **Knowledge Management, Information Sharing and Reporting**
   UN-Habitat aims to have a gender responsive knowledge management approach in place, where specific gender considerations are highlighted through reporting on the project/programme's commitment to gender equality and women's empowerment in all outreach, communication and information sharing efforts.

ANNEX 6: Budget notes

Table 51: Budget notes

Outputs	Activities		Notes / Staff	TOTAL	Year 1	Year 2	Year 3	Year 4		No.	Salary Base Rate	Rate	Year 1	Year 2	Year 3	Year 4	T
													12	12	12	12	48
Project components																	
Output 1.1 Territorial planning and development strategy / guidelines at district level with climate change and gender mainstreamed (Lebanon)	Phase 1: assessment	Launching and discussing assessment approach and outcomes	Workshop	**4,000**	4,000	-		-		1		2,000	2				2
		General methodology and framework	Spatial / urban planner	**28,000**	28,000	-	-	-		2		3,500	4				4
		Climate change dynamics and mapping and analysis	Climate change expert	**7,000**	7,000	-	-	-		1		3,500	2				2
		Urbanization dynamics mapping and analysis	Climate change expert + GIS expert	**7,000**	7,000	-	-	-		1		3,500	2				2
		Agricultural dynamics mapping and analysis	Agriculture expert	**7,000**	7,000	-	-	-		1		3,500	2				2
		Water issues mapping and analysis	Water expert	**7,000**	7,000	-	-	-		1		3,500	2				2
		Soil issues mapping and analysis	Hydrology expert	**7,000**	7,000	-	-	-		1		3,500	2				2
		Complementary field investigations	Field expert	**7,000**	7,000	-	-	-		1		3,500	2				2
		Transversal analysis	Spatial / urban planner	**14,000**	14,000	-	-	-		2		3,500	2				2
		Drafting phase 1 report: Assessment outcomes	Spatial / urban planner	**2,500**	2,500	-	-	-		1		2,500	1				1
	Phase 2: planning scenarios	Identifying and projecting possible scenarios	Spatial / urban planner + GIS expert	**7,000**	7,000	-	-	-		1		3,500	2				2
		Discussing and adopting most probable scenario	Spatial / urban planner + Workshop	**9,000**	9,000	-	-	-		2		3,500	1				1
		Defining main needed adaptation responses to this scenario	Spatial / urban planner - CC, Agri, Wa exp	**14,000**	14,000	-	-	-		2		3,500	2				2
		Setting a monitoring framework (follow up indicators, etc.)	Spatial / urban planner	**3,500**	3,500	-	-	-		1		3,500	1				1
		Contingency roadmap for sudden changes in adopted scenario	Spatial / urban planner - CC, Agri, Wa exp	**7,000**	7,000	-	-	-		2		3,500	1				1

		Drating Phase 2 report: Planning / development scenarios	Spatial / urban planner	**3,500**	3,500	-	-	-		1		3,500	1				1
	Phase 3: implement strategy / guidelines	Strategy / guidelines for BWE	Spatial / urban planner	**14,000**	14,000	-	-	-		2		3,500	2				2
		Strategy / guidelines for DGU	Spatial / urban planner	**14,000**	14,000	-	-	-		2		3,500	2				2
		Strategy / guidelines MoA	Spatial / urban planner	**14,000**	14,000	-	-	-		2		3,500	2				2
		Training BWE, DGU, MoA on use of guidelines	Spatial / urban planner	**14,000**	14,000	-	-	-		2		3,500	2				2
		Drafting Phase 3 report: Strategy / guidelines	Spatial / urban planner	**3,500**	3,500	-	-	-		1		3,500	1				1
		Presenting and discussing outcomes	Workshop	**2,000**	2,000	-	-	-		1		2,000	1				1
		Communication / publication	Printing, etc.	**5,000**	5,000	-	-	-		1		5,000	1				1
		Sub Project Coordination (RTO)	Technical support to execute output 1.1 activities	**48,000**	48,000	-	-	-		1		4,000	12				12
Sub-total				**249,000**	**249,000**	**-**	**-**	**-**										
Output 1.2. Urban master plans at municipal level with climate change and gender mainstreamed(Lebanon)	Phase 1: assessment	Launching, participatory and assessment session	Workshop	**64,000**	64,000	-	-	-		8		2,000	4				4
		Assessing and mapping dynamics in 8 municipalities	Spatial / urban planner / GIS expert	**56,000**	49,000	7,000	-	-		2		3,500	7	1			8
		Analyses CC / Water/ Agri / Soil risks and opportunities	CC, Wa, Agri, Hydro exp	**72,000**	60,000	12,000	-	-		4		3,000	5	1			6
		Drafting Phase 1 assessment reports for the 8 municipalities	Spatial / urban planner	**21,000**	-	21,000	-	-		3		3,500		2			2
	Phase 2: plan	Development orientations and land use strategies	Spatial / urban planner	**28,000**	-	28,000	-	-		2		3,500		4			4
			Workshop	**16,000**	-	16,000	-	-		8		2,000		1			1
		Drafting Phase 2 proposition strategies for the 8 municipalities	Spatial / urban planner	**21,000**	-	21,000	-	-		3		3,500		2			2
	Phase 3 Complement	Planning complementarity at the level of the Central Bekaa	Spatial / urban planner	**21,000**	-	21,000	-	-		3		3,500		2			2
			Workshop	**4,000**	-	4,000	-	-		2		2,000		1			1
		Drafting Phase 3 report: complementary	Spatial / urban planner	**3,500**	-	3,500	-	-		1		3,500		1			1
	Phase 4 Implement	Localized action plans and conceiving potential	Spatial / urban planner	**10,500**	-	10,500	-	-		1		3,500		3			3
			Urban Designer	**10,500**		10,500	-	-		1		3,500		3			3

		urban design interventions	Water Expert	**3,500**		3,500	-	-		1		3,500		1			1
			Agricultural Expert	**3,500**		3,500	-	-		1		3,500		1			1
			CC and DRR Expert	**3,500**	-	3,500	-	-		1		3,500		1			1
			Field investigators	**9,000**		9,000	-	-		2		1,500		3			3
		Drafting Phase 4 report: action plans and feasibility assessments	Spatial / urban planner	**7,000**	-	7,000	-	-		1		3,500		2			2
		Sub Project Coordination (RTO)	Technical support to execute output 1.2 activities	**72,000**	36,000	36,000				2		4,000	9	9			
		Communication / publication	Printing, etc.	**6,000**	4,000	2,000	-	-		1		2,000	2	1			3
	Phase 5: Operate and sustain	Establish and running of urban observatory (1) to collect and analyse climate change data, and plan and revise plans with climate change data	Capacity building and training on GIS, Oracle, SPSS, localization of SDGs, climate data, etc.	**20,000**	7,500	7,500	2,500	2,500		1		2,500	3	3	1	1	8
			Personnel	**18,000**	4,500	4,500	4,500	4,500		1		1,500	3	3	3	3	12
			Equipment, softw are and office supply	**20,000**	20,000	-	-	-		1		20,000	1				1
			Satellite imagery and maps	**15,000**	5,000	5,000	5,000	-		1		5,000	1	1	1		3
			Portal and smart application	**25,000**	10,000	5,000	5,000	5,000		1		5,000	2	1	1	1	5
Sub-total				**530,000**	**260,000**	**241,000**	**17,000**	**12,000**									
Output 1.3. Urban master plans at municipal level with climate change and gender mainstreamed (Jordan)	Phase 1: assessment	Launching, participatory and assessment session	Workshop	**64,000**	64,000	-	-	-		8		2,000	4				4
		Assessing and mapping dynamics in 2 municipalities (Mafraq; Irbid)	Spatial / urban planner / GIS expert	**56,000**	49,000	7,000	-	-		2		3,500	7	1			8
		Analyses CC / Water/ Agri / Soil risks and opportunities	CC, Wa, Agri, Hydro exp	**72,000**	60,000	12,000	-	-		4		3,000	5	1			6
		Drafting Phase 1 assessment reports for the 2 municipalities	Spatial / urban planner	**21,000**	-	21,000	-	-		3		3,500		2			2
	Phase 2: plan	Development orientations and land use strategies	Spatial / urban planner	**28,000**	-	28,000	-	-		2		3,500		4			4
			Workshop	**16,000**	-	16,000	-	-		8		2,000		1			1
		Drafting Phase 2 proposition strategies for the 2 municipalities	Spatial / urban planner	**21,000**	-	21,000	-	-		3		3,500		2			2
	Phase 3: Complement	Planning complementarity at	Spatial / urban planner	**21,000**	-	21,000	-	-		3		3,500		2			2

		the water authorities level	Workshop	**4,000**	-	4,000	-	-		2		2,000		1			1
		Drafting Phase 3 report: complementary	Spatial / urban planner	**3,500**	-	3,500	-	-		1		3,500		1			1
	Phase 4: Implement	Llocalized action plans and conceiving potential urban design interventions	Spatial / urban planner	**10,500**	-	10,500	-	-		1		3,500		3			3
			Urban Designer	**10,500**		10,500	-	-		1		3,500		3			3
			Water Expert	**3,500**		3,500	-	-		1		3,500		1			1
			Agricultural Expert	**3,500**		3,500	-	-		1		3,500		1			1
			CC and DRR Expert	**3,500**	-	3,500	-	-		1		3,500		1			1
			Field investigators	**9,000**		9,000	-	-		2		1,500		3			3
		Drafting Phase 4 report: action plans and feasibility assessments	Spatial / urban planner	**7,000**	-	7,000	-	-		1		3,500		2			2
		Communication / publication	Printing, etc.	**12,000**	-	12,000	-	-		8		2,000		1			1
	Phase 5: Operate and sustain	Support the running of urban observatories (2) to collect and analyse climate change data, and plan and revise plans with climate change data	Capacity building and training on GIS, Oracle, SPSS, localization of SDGs, climate data, etc.	**40,000**	15,000	15,000	5,000	5,000		2		2,500	3	3	1	1	8
			Personnel	**36,000**	9,000	9,000	9,000	9,000		2		1,500	3	3	3	3	12
			Equipment, softw are and office supply	**40,000**	40,000	-	-	-		2		20,000	1				1
			Satellite imagery and maps	**30,000**	10,000	10,000	10,000	-		2		5,000	1	1	1		3
			Portal and smart application	**50,000**	20,000	10,000	10,000	10,000		2		5,000	2	1	1	1	5
Sub-total				**562,000**	**267,000**	**237,000**	**34,000**	**24,000**									
TOTAL Component 1				**1,341,000**	**776,000**	**478,000**	**51,000**	**36,000**									
Output 2.1 Community organization, awareness and capacity building + operation, maintenance and replication / upscaling plans for concrete adaptation output 3.1: Rooftop Rain Water Harvesting (RWH) in Lebanon	Phase 1: assessment	Detailed technical assessment of target buildings (UNICEF)	Site assessments	**2,000**	2,000	-	-	-		1		100	20				20
			RWH specialist / field engineer	**3,000**	3,000	-	-	-		1		3,000	1				1
	Phase 2: plan	Detailed technical design of systems (UNICEF)	RWH specialist	**12,000**	12,000	-	-	-		1		3,000	4				4
	Phase 4: O & M	Awareness raising and capacity building focused on water scarcity challenges in target buidlings (UNICEF)	Awareness raising campaign in target buildings about climate change-related water scarcity challenges and adaptation options, incl. RWH ~~through religious & governmental~~	**12,500**	2,500	5,000	5,000	-		1		2,500	1	2	2		5

			~~buildings, and educational & health facilities~~															
		Awareness raising and capacity building to operate and maintain project activities (UNICEF)	Training sessions / workshops on O&M for the target building staff, and municipalities' staff + Operation & Maintenance manuals for target Municipalities	**30,000**	-	10,000	10,000	10,000		1		1,000		10	10	10	30
			Evaluating water use for urban usages study	**15,000**	-	-	-	15,000		1		15,000				1	1
			Operation & maintenance plans for target buidings	**12,600**	-	6,300	6,300	-		1		150		42	42		84
			Operation & maintenance plan at municipal / ministerial level	**3,000**	-	-	3,000	-		1		3,000			1		1
			Central and remote sensor and control unit for each site (for monitoring)	**20,000**	-	10,000	10,000	-		1		1,000		10	10		20
		Sub Project Coordination (RTO)	Technical support to execute output 2.1 activities	**32,500**	6,500	9,750	9,750	6,500		1		3,250	2	3	3	2	
	Phase 5: Replicate + Scale-up	Awareness raising and capacity building to replicate and scale-up project activities (UNICEF)	Replication / upscaling plan and guidelines to operate, maintain, sustain and replicate the RWH systems beyond the project	**10,000**	-	-	-	10,000		1		10,000				1	1
	Technical support and coordination	Sub-project Coordination and technical support (UNICEF)	Sub-project coordination / communication (50 %)	**24,800**	6,200	6,200	6,200	6,200		0.5		3,100	4	4	4	4	16
			Technical support to execute above activities (50 %)	**15,000**	3,750	3,750	3,750	3,750		0.5		2,500	3	3	3	3	12
			Logistics, admin and accountancy (50 %)	**3,000**	750	750	750	750		0.5		1,500	1	1	1	1	4
Sub-total				**195,400**	**36,700**	**51,750**	**54,750**	**52,200**									
Output 2.2. Community organization, awareness and capacity building + operation, maintenance and	Phase 1: assessment	Detailed technical assessment of target buildings (84, of which 18 rehabilitation)	Site assessments (coordinate with output 2.3)	**4,200**	4,200	-	-	-		1		50	84				84
			RWH specialist / field engineer (coordinate with output 2.3)	**6,000**	6,000	-	-	-		1		1,500	4				4

replication / upscaling plans for concrete adaptation output 3.1: Rooftop Rain Water Harvesting (RWH) in Jordan	Phase 2: plan	Detailed technical design of systems (6484, of which 18 rehabilitation)	RWH specialist / field engineer (coordinate with output 2.3)	**9,000**	9,000	-	-	-		1		1,500	6				6
	Phase 4: O & M	Awareness raising and capacity building to operate and maintain systems (6484, of which 40 both24 for RWH and 40 for GWTR) in target buildings	Training sessions / workshops on O&M for the target building staff, official departments and directorates, ministries' and municipalities' staff (coordinate with output 2.3)	**56,400**	-	25,200	25,200	6,000		1		600		42	42	10	94
			Operation & maintenance plans for target buildings (coordinate with output 2.3)	**12,600**	-	6,300	6,300	-		1		150		42	42		84
			Operation & maintenance plan at municipal / ministerial level (coordinate with output 2.3)	**3,000**	-	-	3,000	-		1		3,000			1		1
	Phase 5: Replicate + Scale-up	Awareness raising and capacity building to replicate and scale-up project activities	Under output 2.3.	**-**	-	-	-	-									0
	Technical support and coordination	Sub-project Coordination and technical support (Johud)	Sub-project coordination (50 %)	**30,000**	7,500	7,500	7,500	7,500		0.5		2,500	6	6	6	6	24
			Technical support to execute activities (50 %)	**15,000**	3,750	3,750	3,750	3,750		0.5		2,500	3	3	3	3	12
			Logistics, admin and accountancy (50 %)	**3,000**	750	750	750	750		0.5		1,500	1	1	1	1	4
Sub-total				**139,200**	**31,200**	**43,500**	**46,500**	**18,000**									
Output 2.3. Community organization, awareness and capacity building + operation, maintenance and replication / upscaling plans for concrete adaptation output 3.3: Grey Water Treatment and Reuse (GWTR) in Jordan	Phase 1: assessment	Detailed technical assessment of target buildings (40)	Site assessments (coordinate with output 2.2)	**2,000**	2,000	-	-	-		1		50	40				40
			GWTR specialist / field engineer (coordinate with output 2.2)	**6,000**	6,000	-	-	-		1		1,500	4				4
	Phase 2: plan	Detailed technical design of systems (40)	GWTR specialist / field engineer (coordinate with output 2.2)	**9,000**	9,000	-	-	-		1		1,500	6				6
	Phase 4: O & M	Awareness raising and capacity building to operate and maintain system (84, of which 40 both RWH and GWTR) in target buildings	Awareness raising campaign in target municipalities and target buildings about climate change-related water scarcity	**42,000**	-	21,000	21,000	-		1		500		42	42		84

Commented [JD13]: After reviewing the budget, JOHUD realised that now the budget allocated is enough for 24 trainings instead of 40 for RWH

			challenges and adaptation options, incl. RWH and GWR through Imams and curriculum in schools (coordinate with output 2.2)															
			Under output 2.2.	**-**	-	-	-	-										0
			Under output 2.2.	**-**	-	-	-	-										0
			Under output 2.2.	**-**	-	-	-	-										0
			Central and remote sensor and control unit for each site (for monitoring) (coordinate with output 2.2)	**84,000**	-	42,000	42,000	-		1		1,000		42	42		84
	Phase 5: Replicate + Scale-up	Awareness raising and capacity building to replicate and scale-up project activities	Replication / upscaling plan and guidelines to operate, maintain, sustain and replicate the GWTR systems beyond the project, incl school curriculum (coordinate with output 2.2)	**15,000**	-	-	-	15,000		1		15,000				1	1
	Technical support and coordination	Sub-project coordination and technical support (UNICEF Jordan)	Sub-project coordination (100 %)	**40,000**	10,000	10,000	10,000	10,000		1		2,500	4	4	4	4	16
			Technical support to execute above activities (100 %)	**30,000**	7,500	7,500	7,500	7,500		1		2,500	3	3	3	3	12
			Logistics, admin and accountancy (100 %)	**6,000**	1,500	1,500	1,500	1,500		1		1,500	1	1	1	1	4
Sub-total				**234,000**	**36,000**	**82,000**	**82,000**	**34,000**										
Output 2.4. Community organisation, awareness and capacity building + operation, maintenance and replication and upscaling plans for concrete adaptation output 3.4: Efficient treatment and reuse of wastewater,from Zahle WWTP, in Lebanon	Phase 1: assessment	Detailed technical assessment of the ~~irrigation canal~~treated wastewater storage and conveying system and surrounding agricultural areas (UNICEF and RTO)	Site assessments + Surveying public opinion of farmers in accepting reused wastewater	**9,000**	9,000	-	-	-		1		1,500	6				6
			Civil/ Agricultural Engineer	**13,200**	13,200	-	-	-		1		2,200	6				6
	Phase 2: plan	Detailed technical design of the ~~open canal~~treated wastewater storage and conveying system (UNICEF)	Civil/ Agricultural Engineer	**13,200**	13,200	-	-	-		1		2,200	6				6
		EIA study	Preparation of EIA study by certified consultant	**10,000**	10,000					1		10,000	1				1

	Phase 4: O & M	Surveys and studies developed for understanding adaptation measures in Zahle (UNICEF)	Development of public awareness to encourage acceptance of treated waste water and to focus on water scarcity issues in Zahle for 1,000 farmers	**12,500**	2,500	5,000	5,000	-		1		2,500	1	2	2		5
		Awareness raising and capacity building to operate and maintain project activities (**UNICEF**)	Training sessions / workshops / Manuals and Tools on O&M for the BWE and the Municipality of Zahle	**4,500**	-	1,500	1,500	1,500		1		1,500		1	1	1	3
			Provision of chemical supplies to BWE laboratory to conduct required water and wastewater sampling	**50,400**	14,400	14,400	14,400	7,200		1		1,200	12	12	12	6	42
			Operation & maintenance plans for target farmers	**3,900**	-	-	1,950	1,950		1		1,950			1	1	2
	Phase 5: Replicate + Scale-up	Awareness raising and capacity building to replicate and scale-up project activities	Replication / upscaling plan and guidelines to operate, maintain, sustain and replicate wastewater reuse and to ensure proper tariffs through a socio-economic study (Private Sector)	**25,000**	-	-	25,000	-		1		25,000			1		1
	Technical support and coordination	Supervision of the awareness campaigns implementation and development	Sub-project Coordination/community mobilization	**31,500**	9,000	9,000	9,000	4,500		1		2,250	4	4	4	2	14
Sub-total				**1[illegible]3,200**	**61,300**	**29,900**	**56,850**	**15,150**									
Output 2.5. Community organisation, awareness and capacity building + operation, maintenance and replication and upscaling plans for concrete adaptation output 3.5: Efficient treatment and reuse of wastewater in Jordan	Phase 3: Implement	Concrete intervention see output 3.5		**-**	-	-	-	-		1							0
	Phase 4: O & M	Operate and maintain project activities.	Operation & maintenance plans for proposed interventions. Some spare parts are provided under output 3.5	**6,000**	-	-	6,000	-		1		6,000			1		1
	Phase 5: Replicate + Scale-up	Capacity building to replicate and scale-up sub-project activities	Replication / upscaling plan and guidelines to operate, maintain, sustain and	**10,000**	-	-	-	10,000		1		10,000				1	1

			replicate cc resilient WWTPs beyond the project															
	Technical support and coordination	In kind		-	-	-	-	-		1								0
Sub-total				**16,000**	**-**	**-**	**6,000**	**10,000**										
Output 2.6. Community organisation, awareness and capacity building + operation, maintenance and replication and upscaling plans for concrete adaptation output 3.6.1 Water-use-efficient irrigation of treated wastewater for fruit trees in Lebanon from Zahle WWTP, Lebanon	Phase 1: assessment	Detailed technical assessment of agricultural fruit lands and irrigation systems (UNICEF and RTO)	Site assessments and visits to farmers	**6,000**	6,000	-	-	-		1		100	60				60
			Civil/ Agricultural engineer	**4,000**	4,000	-	-	-		1		2,000	2				2
	~~Phase 2: plan~~	~~Detailed technical design of the drip irrigation systems (UNICEF)~~	~~Irrigation specialist~~	~~**5,000**~~	~~5,000~~	-	-	-		~~1~~	-	~~5,000~~	~~1~~	-	-	-	~~1~~
	Phase 4: O & M	Awareness raising and capacity building trainings (UNICEF)	Workshop on installing and operating drip irrigation systems with practical field demonstration	**15,000**	7,500	7,500	-	-		1		7,500	1	1			2
		Awareness raising and capacity building to operate and maintain project activities (UNICEF)	Awareness raising campaign in Zahle about climate change-related water scarcity challenges and adaptation options, incl. Fertigation awareness for fruit trees through workshops	**8,000**	-	4,000	4,000	-		1		4,000		1	1		2
			Development of existing agricultural cooperatives, technical assistance in selecting crops, irrigation methods (UNICEF in cooperation with LARI)	**15,000**	-	-	15,000	-		1		15,000			1		1
			Training sessions / workshops / Tools on O&M for the target farmers	**2,500**	-	-	2,500	-		1		2,500			1		1
	Phase 5: Replicate + Scale-up	Awareness raising and capacity building to replicate and scale-up project activities (UNICEF)	Replication / upscaling plan and guidelines to operate, maintain, sustain and replicate smart and efficient drip irrigation techniques and to investigate	**20,000**	-	-	20,000	-		1		20,000			1		1

			permaculture guidelines and testing in the Central Bekaa area														
	Technical support and coordination	Sub-project Coordination and technical support (RTO)	Sub Project coordination and supervision	~~43,200~~33,200	10,800	10,800	10,800	10,800		0.3		3,000	12	12	12	12	48
		Supervision of the awareness campaigns implementation and development	Community Mobilization	**23,400**	5,850	5,850	5,850	5,850		0.3		1,950	12	12	12	12	48
Sub-total				**1~~67~~,100**	**39,150**	**28,150**	**58,150**	**16,650**									
Output 2.7.1 Community organisation, awareness and capacity building + operation, maintenance and replication and upscaling plans for concrete adaptation output 3.7:Water-use Efficient irrigation of treated wastewater from Maerad and Al Kaider WWTPs in Jordan	Phase 1: assessment	Formulate a rehabilitation study for individual farm (40) end-user/Groups based on agreed-upon climate change resilient/irrigation water need/use, cropping patterns	Preparation visits	**4,000**	4,000	-	-	-		1		100	40				40
			Stakeholder sessions / workshops	**2,800**	2,800	-	-	-		1		700	4				4
	Phase 2: plan	Water user associations established (Al-Akaidr and Al Maerad)	Preparation visits	**1,200**	1,200	-	-	-		1		100	12				12
			Stakeholder sessions / workshops	**2,800**	2,800	-	-	-		1		700	4				4
	Phase 4: O & M	Awareness raising and capacity building to operatate and maintain project activities	Capacity building of 58-60 water association members to run the association	**30,000**	30,000	-	-	-		1		1,000	30				30
			Capacty building of 100 farmworkers on handling reclaimed water	**30,000**	-	30,000	-	-		1		1,000		30			30
			Operation & maintenance plans for target irrigation systems at 40 farms	**8,000**	-	8,000	-	-		1		200		40			40
			Monitoring	**8,000**	-	-	4,000	4,000		1		100			40	40	80
	Phase 5: Replicate + Scale-up	Awareness raising and capacity building to repicate and scale-up project activities	Replication / upscaling plan and guidelines to operate, maintain, sustain and replicate the planning approach and irrigation interventions	**10,000**	-	-	-	10,000		1		10,000				1	1
	Technical support and coordination	Sub-project Coordination and	Sub-project coordination (50 %)	**30,000**	7,500	7,500	7,500	7,500		0.5		2,500	6	6	6	6	24

		technical support (Johud)	Technical support to execute activities (50 %)	**15,000**	3,750	3,750	3,750	3,750		0.5		2,500	3	3	3	3	12
			Logistics, admin and accountancy (50 %)	**3,000**	750	750	750	750		0.5		1,500	1	1	1	1	4
		Sub-total Maerad and Al Kaider		**144,800**	**52,800**	**50,000**	**16,000**	**26,000**									
Output 2.7.2 Community organisation, awareness and capacity building + operation, maintenance and replication and upscaling plans for concrete adaptation output 3.7:Water-use Efficient irrigation of treated wastewater from Mafraq WWTP in Jordan	Phase 1: assessment	Formulate a rehabilitation study for individual farm (24) end-user/Groups based on agreed-upon climate change resilient/irrigation water need/use, cropping patterns	Preparation visits	**2,400**	2,400	-	-	-		1		100	24				24
			Stakeholder sessions / workshops	**2,800**	2,800	-	-	-		1		700	4				4
	Phase 2: plan	Water user associations established (Mafraq)	Preparation visits	**600**	600	-	-	-		1		100	6				6
			Stakeholder sessions / workshops	**2,800**	2,800	-	-	-		1		700	4				4
	Phase 4: O & M	Awareness raising and capacity building to operatate and maintain project activities	Capacity building of 24 water association members to run the association	**15,000**	15,000	-	-	-		1		1,000	15				15
			Capacty building of 50 farmworkers on handling reclaimed water	**15,000**	-	15,000	-	-		1		1,000		15			15
			Operation & maintenance plans for target irrigation systems at 40 farms	**4,800**	-	4,800	-	-		1		200		24			24
			Monitoring	**4,800**	-	-	2,400	2,400		1		100			24	24	48
	Phase 5: Replicate + Scale-up	Awareness raising and capacity building to repicate and scale-up project activities	Replication / upscaling plan and guidelines to operate, maintain, sustain and replicate the planning approach and irrigation interventions	**10,000**	-	-	-	10,000		1		10,000				1	1
	Technical support and coordination	Sub-project Coordination (Badia)	Sub-project coordination (100 %)	**30,000**	7,500	7,500	7,500	7,500		1		2,500	3	3	3	3	12
			Technical support to execute activities (100 %)	**20,000**	5,000	5,000	5,000	5,000		1		2,500	2	2	2	2	8
			Logistics, admin and accountancy (100 %)	**6,000**	1,500	1,500	1,500	1,500		1		1,500	1	1	1	1	4
		Sub-total Mafraq		**114,200**	**37,600**	**33,800**	**16,400**	**26,400**									
Sub-total				**259,000**	**90,400**	**83,800**	**32,400**	**52,400**									

Output 2.8. Community organisation, awareness and capacity building + operation, maintenance and replication and upscaling plans for concrete adaptation output 3.8; permaculture demonstration	Phase 1: assessment	Detailed technical studies for systems integration (plant, animal, water, energy, soil and human) (PRI)	Permaculture systems advisor (international)	24,400 ~~12,050.52~~	24,400 ~~12,050.52~~	- -	- -	- -		1~~1~~	-	6,100 ~~3,012.63~~	4~~4~~	-	-	-	4~~4~~
	Phase 2: plan	Detailed technical design for systems integration (plant, animal, water, energy, soil and human) (PRI)	Permaculture systems advisor (international)	24400 ~~12,050.52~~	24,400 ~~12,050.52~~	- -	- -	- -		1~~1~~	-	6,100 ~~3,012.63~~	4~~4~~	-	-	-	4~~4~~
	Phase 4: O & M	Awareness raising and capacity building to operatate and maintain project activities (PRI)	Workshops to involve surrounding communities (site visits and deisgn and operation training)	**10,000**	3,000	3,000	2,000	2,000		1		1,000	3	3	2	2	10
			Operation & maintenance plan	**2,000**	-	2,000	-	-		1		2,000		1			1
			Online Permaculture Design Certificate Course (28 modules, released weekly + final design exercise at Local University / Research Centre~~JUST~~ land or land owned by local community members. Cost per student	**170,000** ~~149,400~~	42,500 ~~37,350~~	42,500 ~~37,350~~	42,500 ~~37,350~~	42,500 ~~37,350~~		50~~50~~	-	850 ~~747~~	1~~1~~	1~~1~~	1~~1~~	1~~1~~	4~~4~~
	Phase 5: Replicate + Scale-up	Awareness raising and capacity building to repicate and scale-up project activities (PRI)	Workshops to involve surrounding communities (site visits and replication training)	**4,000**	-	-	2,000	2,000		1		1,000			2	2	4
			Replication / upscaling plan and guidelines, incl. permaculture landscape design plan for surrounding communities	**5,000**	-	-	-	5,000		1		5,000				1	1
	Technical support and coordination	Sub-project Coordination (PRI)	Sub-project coordination / strategic advisor (internat) (100 %)~~Australian Legal and Bookkeeper~~	**48,800** ~~60,000~~	12,200 ~~15,000~~	12,200 ~~15,000~~	12,200 ~~15,000~~	12,200 ~~15,000~~		1~~1~~	-	6,100 ~~7,500~~	2~~2~~	2~~2~~	2~~2~~	2~~2~~	8~~8~~
			Technical support to execute activities (100 %)	**20,000** ~~60,931.68~~	5,000 ~~15,232.92~~	5,000 ~~15,232.92~~	5,000 ~~15,232.92~~	5,000 ~~15,232.92~~		1~~1~~	-	2,500 ~~7,617~~	2~~2~~	2~~2~~	2~~2~~	2~~2~~	8~~8~~
			Logistics, admin and accountancy (100 %)(LOCAL)	**6,000** ~~25,000~~	1,500 ~~10,000~~	1,500 ~~5,000~~	1,500 ~~5,000~~	1,500 ~~5,000~~		1~~1~~	-	1,500 ~~5,000~~	1~~2~~	1~~1~~	1~~1~~	1~~1~~	4~~5~~

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			~~Legal (Local)~~	~~**11,283.64**~~	~~2,820.91~~	~~2,820.91~~	~~2,820.91~~	~~2,820.91~~										
Sub-total				~~314,600 351,716.36~~	~~113,000 112,504.87~~	~~66,200 85,403.83~~	~~65,200 84,403.83~~	~~70,200 89,403.83~~										
Output 2.9. Community organisation, awareness and capacity building + operation, maintenance and replication and upscaling plans for concrete adaptation output 3.9; permaculture demonstration	Phase 1: assessment	Identification of agriculture practices, lands, farmers	UNICEF, Regional Technical Office	**7,700**	7,700	-	-	-		1		1,925	4				4
	Phase 2: plan	Detailed technical guidelines for agriculture waste management and sustainable crop production	Printing, etc.	**10,000**	-	-	-	10,000		1		10,000				1	1
	Phase 3: Implement	Concrete intervention see output 3.8															0
	Phase 4: O & M	Awareness raising and capacity building to operate and maintain project activities	Operation & maintenance plan and upgrade of LARI's mobile application to include: '- All tested crops varieties affected and suitable for climate change - A list of farmers in the area (connecting farmers together) - Broadcasting all technical guidelines and best practices that pertain to the project and beyond it	**10,000**	-	10,000	-	-		1		10,000		1			1
			Training/Workshop for farmers on Permaculture practices +UNICEF in coordination with LARI to give out certificates and books/study materials to farmers that attend training on Permaculture (3 per year (30 participants per workshop = 270 participants in total) over 3 year span) (participants to receive all material)	**241,071**	80,357	80,357	80,357	-		1		893	90	90	90		270
	Phase 5: Replicate + Scale-up	Awareness raising and capacity building to replicate	Workshops to involve surrounding	**4,000**	-	-	2,000	2,000		1		1,000			2	2	4

		and scale-up project activities	communities (site visits and replication training)															
			Replication / upscaling plan and guidelines, incl. permaculture landscape design plan for surrounding communities	**5,000**	-	-	-	5,000		1		5,000				1	1
	Technical support	Sub-project Coordination (UNICEF)	Permaculture expert (International) (20%)	**28,800**	7,200	7,200	7,200	7,200		0.2		3,000	12	12	12	12	48
			Project Management Assistant (National) (20%)	**14,400**	3,600	3,600	3,600	3,600		0.2		1,500	12	12	12	12	48
			Senior strategic project management systems expert & permaculture systems advisor (National) (20%)	**43,200**	10,800	10,800	10,800	10,800		0.2		4,500	12	12	12	12	48
			UNICEFoperation costs (20%)	**24,000**	6,000	6,000	6,000	6,000		0.2		2,500	12	12	12	12	48
			Logistics, admin and accountancy (100 %)	**6,000**	1,500	1,500	1,500	1,500		1		1,500	1	1	1	1	4
		Sub Project Coordination (RTO)	Sub Project coordination and supervision (20%)	**24,000**	6,000	6,000	6,000	6,000		0.2		2,500	12	12	12	12	48
Sub-total				**418,171**	**123,157**	**125,457**	**117,457**	**52,100**										
TOTAL Component 2				**1,~~918876,671787~~**	~~626,413~~ 533,407	~~634,961~~ 508,257	~~633,611~~ 516,807	~~334,904~~ 318,200										
Output 3.1 Rooftop Rain Water Harvesting RWH) in Lebanon + show room	Phase 3: Implement (concrete measures)	Install and connect ~~20~~10 large RWH systems (~~11~~10 educational facilities, ~~7 religious buildings, 1 health facility, and 1 governmental building~~) with the water supply network, including the digging of rain-harvesting cisterns and mounting rectangular tanks ~~1,410~~245 m3. (UNICEF)	~~Collection System (Gutters, Drains, Pumps, Accessories)~~	~~**54,800**~~	~~-~~	~~27,400~~	~~27,400~~	~~-~~	~~-~~	~~1~~	~~-~~	~~2,740~~	~~-~~	~~10~~	~~10~~	~~-~~	~~20~~
			~~Water Treatment systems (Media filter, Micro Filter, Chlorination tanks and dosage pumps)~~	~~**111,682**~~	~~-~~	~~55,841~~	~~55,841~~	~~-~~	~~-~~	~~1~~	~~-~~	~~5,584~~	~~-~~	~~10~~	~~10~~	~~-~~	~~20~~
			~~Reinforced concrete water tanks (with excavations, waterproofing, ladders, valves, reinstatement, etc.)~~	~~**263,656**~~	~~-~~	~~131,828~~	~~131,828~~	~~-~~	~~-~~	~~1~~	~~-~~	~~13,183~~	~~-~~	~~10~~	~~10~~	~~-~~	~~20~~
			~~Plastic Water tanks (inlcuding Excavation, subgrade, fencing and ladders)~~	~~**303,212**~~	~~-~~	~~151,606~~	~~151,606~~	~~-~~	~~-~~	~~1~~	~~-~~	~~15,161~~	~~-~~	~~10~~	~~10~~	~~-~~	~~20~~

			Main drainage lines	45,810	-	22,905	22,905	-		1		4,581		5	5		10
			Plastic reservoirs	55,125	-	27,563	27,563	-		1		5,513		5	5		10
			Pumping lines	17,079	-	8,540	8,540	-		1		1,708		5	5		10
			Centrifugal pumps	6,750	-	3,375	3,375	-		1		675		5	5		-
			Civil works	140,850	-	70,425	70,425	-		1		14,085		5	5		-
			MEP installation	33,750	-	16,875	16,875	-		1		3,375		5	5		-
			Chlorine and filters	67,500	-	33,750	33,750	-		1		6,750		5	5		10
		Show room (1) with rainwater harvesting system and Water Savind Devices (WSD) (UNICEF)	Installation of 1 complete system in Bekaa Water Establishment to enhance monitoring of RWH installed systems	**43,000**	-	-	43,000	-		1		43,000			1		1
	Technical support	Supervision RWH system installation and maintenance (UNICEF Lebanon)	RWH engineer specialist / WASH officer (50 %)	~~90~~50,912	11,3~~1~~64	~~34,092~~14,142	~~34,092~~14,142	11,~~364~~314		0.5		5,~~682~~657	4	~~12~~5	~~12~~5	4	~~32~~18
Sub-total				~~867,263~~460,776	**11,~~364~~314**	~~408,767~~197,574	~~443,767~~240,574	**11,3~~1~~4**									
Output 3.2. Rooftop Rain Water Harvesting (RWH) in Jordan + show room	Phase 3: Implement (concrete measures)	Install and connect ~~64 85~~ small RWH systems (of which 18 rehabilitation~~—2 municipal~~, ~~40 49~~ schools, 10 ~~15~~ mosques, ~~20~~ 14 residential) with the water supply network, including the digging of rain-harvesting cisterns and mounting rectangular tanks 30-60 m3.	Per system including tank, pumps, pipes and surface rehabilitation	**688,000**	-	352,000	336,000	-		1		8,000		44	42		86
			Transportation	**8,820**	-	4,410	4,410	-		1		105		42	42		84
		Show room (2) with RWH system, GWTR system and Water Saving Devices (WSD)	Installation of 2 complete systems in municipal government buildings to enhance awareness raising while	**100,000**	-	100,000	-	-		1		50,000		2			2
	Technical support	Supervision RWH system installation and maintenance (Johud)	RWH enigneer specialist / WASH officer (50 %)	**40,000**	5,000	15,000	15,000	5,000		0.5		2,500	4	12	12	4	32
Sub-total				**836,820**	**5,000**	**471,410**	**355,410**	**5,000**									
Output 3.3. Grey Water Treatment and Reuse (GWTR) in Jordan	Phase 3: Implement (concrete measures)	Install / construct and connect 40 GWTR systems with toilets and gardening water supply (35 schools, 5 mosques)	Per system including tank, pumps, pipes and surface rehabilitation	**320,000**	-	160,000	160,000	-		1		8,000		20	20		40
			Transportation	**4,200**	-	2,100	2,100	-		1		105		20	20		40

Commented [JD14]: After reviewing the budget, JOHUD decided to decrease the number of the RWH systems to install because the prices between 2019 and 2022 increased between 30-40%. The new price of each unit now costs up to 10,647.6 USD

		Rehabilitation and modification of WASH blocks for greywater reuse in toilet flushing and for greeing purposes	Per block	**428,000**	-	214,000	214,000	-		1		10,700		20	20		40
	Technical support	Supervision GWTR system and blocks installation and maintenance (UNICEF Jordan)	RWH engineer specialist / WASH officer (50 %)	**90,912**	11,364	34,092	34,092	11,364		0.5		5,682	4	12	12	4	32
Sub-total				**843,112**	**11,364**	**410,192**	**410,192**	**11,364**									
Output 3.4. Efficient treatment and reuse of wastewater from Zahle WWTP, in Lebanon	Phase 3: Implement (concrete measures)	Reuse of the Zahle WWTP effluent for irrigation through diverting the plant's treated effluent to agricultural fields and treating sludge for fertilizers usage - 800 Hectares of Agricultural lands~~Reuse of the Zahle WWTP effluent for irrigation through diverting the plant's treated effluent to agricultural fields and treating sludge for fertilizers usage - 116 Hectares of Agricultural lands(UNICEF)~~	Construction of a 10,000m3 equalization reservoir and 2 pipelines (3.8km and 5.5km) ~~Construction of a 3000 m open channel (1x1 meters with 0.25m thick walls)~~	~~**795,000**~~ **2,109,236**	-	~~795,000~~ 2,109,236	-	-		1		2,109,236 ~~265~~		~~300~~ ~~0~~1			
	Technical support	Supervision of the irrigation system installation and maintenance (RTO)	Civil works and Agricultural Engineering	**21,120**	4,224	16,896	-	-		1		2,112	2	8			10
		Surveying the alignment of the ~~installed~~ proposed ~~channel along the Litany River~~pipelines along the two zones (UNICEF)	Surveying works	**30,000**	12,000	18,000	-	-		1		1,500	8	12			20
		Technical supervision and oversight of the construction (UNICEF)	UNICEF WASH officers	**86,200**	37,500	48,700				1		1,500	25	32			57
Sub-total				~~**846,120**~~**2,246,556**	~~**16,224**~~**53,724**	~~**829,896**~~**2,192,832**	**-**	**-**									
Output 3.5. Efficient treatment and reuse of wastewater in Jordan	Phase 3: Implement (concrete measures)	Maerad WWTP upgrading for increased water quality and water storage capacity for irrigation purposes	Install Storage tank (2000) m3 and flow meters distribution collector and reuse pipeline to control the	**255,475**	-	255,475	-	-		1		255,475		1			1

			pumping of treated water to farmers and to increase the no. of farmers and areas which reuse treated water															
			Spare parts for equipment	~~28,250~~ 4397543,250	-	4397543,250 ~~28,250~~	-	-		1		4397543,250 ~~28,250~~		1			1
			Air Blower for aeration tank	~~35,300~~100,000	-	~~35,300~~100,000	-	-		1		~~35,300~~100,000		1			1
			2 Polymer pump positive displacement	~~2,800~~10,000	-	~~2,800~~10,000	-	-		1		~~2,800~~10,000		1			1
			Two platforms around dewatering units	**1,400**	-	1,400	-	-		1		1,400		1			1
			Replace inlet pipes to dewatering units from plastic to stainless steal	**1,400**	-	1,400	-	-		1		1,400		1			1
			Supply and install Y strainer for feed line to dewatering machines	**707**	-	707	-	-		1		707		1			1
			Supply new sludge screw to dewatering unit	~~20,000~~30,000	-	~~20,000~~30,000	-	-		1		~~20,000~~30,000		1			1
			Supply conveyer belt with motor and gearbox for dewatering	~~5,650~~10,000	-	~~5,650~~10,000	-	-		1		~~5,650~~10,000		1			1
			4 VFD fans for dewatering unit	**800**	-	800	-	-		1		800		1			1
			Supply Level meter for drainage tank	**2,100**	-	2,100	-	-		1		2,100		1			1
			Supply one drainage pump 18.5 kw 8-25 m H and 20-125 l/s	**10,000**	-	10,000	-	-		1		10,000		1			1
			Supply 2 flow meter for RAS, WAS pumps	**8,000**	-	8,000	-	-		1		8,000		1			1
			Install PV to compensate for energy use	**10,000**	-	10,000	-	-		1		10,000		1			1
			2 blower for equalization tank	15,000		15,000				1		15,000		1			
			1 anaerobic mixer	7,000		7,000				1		7,000		1			
		Sub-total Maerad		~~381,882~~505,132 505,857	-	505,132~~381,882~~	-	-									
		Al Akaider WWTP upgrading for increased water	Install Sand trap and screen unit for inlet	**67,800**	-	67,800	-	-		1		67,800		1			1

Commented [JD15]: This is the newly estimated price for this line item that is proposed by YWC

Commented [JD16]: Estimated price increased to 10,000 instead of 5,600 due to changes in price since 2019

Commented [JD17]: This item was added as per operation requirement, where the existing blowers are out of service now

Commented [JD18]: This item was added as per program requirement, where two mixers are on site now and a third mixer is needed to ensure operation sustainability

		quality and water storage capacity for irrigation purposes	Install 2 new pumps with control panel with level control with soft start with electrical crane + pipe network installing and fabrication	**113,000**	-	113,000	-	-		1		113,000		1			1
			Install basket screen on inlet of storage tank to protect the pumps and ensure continues pumping for farmers	**1,400**	-	1,400	-	-		1		1,400		1			1
			Chlorine unit for disinfection treated water	**14,100**	-	14,100	-	-		1		14,100		1			1
			~~Maintain all gates and bridges for ponds~~	~~7,000~~	-	~~7,000~~	-	-		~~1~~		~~7,000~~		~~1~~			~~1~~
			Install Storage tank (~~2000~~ 500) m3 and flow meters distribution collector and reuse pipeline to control the pumping of treated water to farmers and to increase the no. of farmers and areas which reuse treated water	**~~255,475~~100.000**	**-**	**~~255,475~~100.000**	**-**	**-**		**1**		**~~198,000~~10 0 ,000**		**1**			**1**
			~~Clean anaerobic pond~~	~~71,000~~	-	~~71,000~~	-	-		~~1~~		~~71,000~~		~~1~~			1
			Replace 6 gates between tanks	**20,000**		20,000				1		20,000		1			1
			Replace all bridges and stairs	**15,000**		15,000				1		15,000		1			1
			Monitoring room 25m2	**10,000**		10,000				1		10,00		1			1
			Install new pipe line from inlet to anaerobic pond	**14,100**	-	14,100	-	-		1		14,100		1			1
			Install PV to compensate for energy use	**10,000**	-	10,000	-	-		1		10,000		1			1
		Sub-total Al Akaider		**~~553,875~~365,400**	**-**	**~~553,875~~365,400**	**-**	**-**									
		Mafraq WWTP upgrading for increased water quality for irrigation purposes	Spare parts for equipment	**28,250**	-	28,250	-	-		1		28,250		1			1
			two Soft starter for pumps of lift station	**8,400**	-	8,400	-	-		1		8,400		1			1
			Two aerator units for ponds	**12,125**	-	12,125	-	-		1		12,125		1			1

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Commented [JD19]: Storage tanks were reduced to 500 m3 instead of 2000m3 after studying the operation requirement. The 500 m3 tank will be enough to supply reuse water to the farmer

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			One irrigation pump (higher head for far area) to increase the area which reuses treated water	**35,300**	-	35,300	-	-		1		35,300		1			1
			One lifting pump, one primary sludge pump	**15,000**	-	15,000	-	-		1		15,000		1			1
			20 valve for drying beds	**8,000**		8,000				1		8,000		1			1
			2 sludge mixer for sludge lagoon	**40,000**		40,000				1		40,000		1			1
			2 scum pumps	**10,000**		10,000				1		10,000		1			1
			3 primary pumps	**15,000**		15,000				1		15,000		1			1
			~~Modify conveyor belt of screen by install new mechanical belt conveyor~~	~~**8,500**~~	-	~~8,500~~	-	-		1		~~8,500~~		1			1
			Install PV to compensate for energy use	**10,000**	-	10,000	-	-		1		10,000		1			1
		Sub-total Mafraq		~~**117,575**~~**182,075**	**-**	~~**182,075**~~**117,575**	**-**	**-**									
	Technical support	Supervisision WWTPs ugradings measures installation and maintenance (WAJ / Yarmouk)	In-kind														
Sub-total				~~1,063,332~~ 1,053,332 ~~1,052,607~~	**-**	1,053,332 ~~1,052,607~~ ~~1,063,332~~	**-**	**-**									
~~**Output 3.6.** Water-use efficient irrigation of treated wastewater for fruit trees in Lebanon from Zahle WWTP, Lebanon~~	~~Phase 3: Implement (concrete measures)~~	~~Installation of drip irrigation systems (150 ha) for fruit trees, vineyards and potato plantation (UNICEF)~~	~~Drip Irrigation (including pumps and filters)~~	~~**939,000**~~		~~469,500~~	~~469,500~~		-	~~1~~	-	~~6,260~~	-	~~75~~	~~75~~	-	~~150~~
			~~Sensors, automated tools (includes valves, regulators, fittings)~~	~~**3,750**~~		~~1,875~~	~~1,875~~		-	~~1~~	-	~~25~~	-	~~75~~	~~75~~	-	~~150~~
	~~Technical support~~	~~Supervision of the irrigation system installation and maintenance (UNICEF)~~	~~Civil works and Agricultural Engineering~~	~~**46,200**~~	~~6,600~~	~~26,400~~	~~13,200~~		-	~~1~~	-	~~2,200~~	~~3~~	~~12~~	~~6~~	-	~~21~~
~~**Sub-total**~~				~~**988,950**~~	~~**6,600**~~	~~**497,775**~~	~~**484,575**~~	**-**									
Output 3.7.1 Water-use Efficient irrigation of treated wastewater from Maerad and Alkaider WWTPs in Jordan	Phase 3: Implement (concrete measures)	Connect WWTPs stored water with farm lands	4 KMs conveyor pipeline 6' size	**120,000**	-	120,000	-	-		1		30		400 0			400 0
			Installation 4000 m	**20,000**	-	20,000	-	-		1		5		400 0			400 0
		Establish a new modern water irrigation system connecting main water irrigation pipe	For 120 dunum	**240,000**	-	240,000	-	-		1		2,000		120			120

Commented [JD20]: The new items below were added after review as per operation requirement

		with farm lands (120 dunums)																
	Technical support	Supervisision irrigation system installation and maintenance (Johud)	Irrigation specialist / field engineer (50 %)	**26,400**	4,800	14,400	3,600	3,600		0.4		3,000	4	12	3	3	22
		Sub-total irrigation from Mearad and Al Akaider		**406,400**	**4,800**	**394,400**	**3,600**	**3,600**									
Output 3.7.2 Water-use Efficient irrigation of treated wastewater from Mafraq WWTP in Jordan	Phase 3: Implement (concrete measures)	Establish a new modern water irrigation system connecting water ponds with farm lands (75100 dunum) (Badia)	For ~~100~~ 75 dunums(Includes purchasing agriculture machinery)	**200,000**	-	200,000	-	-		1		2,000		100			100
			Establish new water ponds (~~8~~15) with surface pumps and filters at farm lands	**150,000**	-	150,000	-	-		1		10,000		15			15
	Technical support	Supervision irrigation system installation and maintenance (Badia)	Irrigation specialist / field engineer (100 %)	**48,000**	6,000	36,000	3,000	3,000		1		3,000	2	12	1	1	16
		Sub-total irrigation from Mafraq		**398,000**	**6,000**	**386,000**	**3,000**	**3,000**									
Sub-total				**804,400**	**10,800**	**780,400**	**6,600**	**6,600**									
Output 3.8. Permaculture demonstration - closed loop water system in Jordan	Phase 3: Implement (concrete measures)	Bio-Fertilizer production	Compost turnerJPH ~~Compost turner~~	31,030~~24,871.27~~	31,030 ~~24,871.27~~	- -	- -	- -		~~1~~1	~~-~~	31,030 ~~24,871~~	~~1~~1	~~-~~	~~-~~	~~-~~	~~1~~1
			Tractor Massey FergusonArmaTrac ~~854E+/24+24~~	32,445~~32,445~~**36, 953.92**	32,445 ~~36,953.92~~	- -	- -	- -		1		32,445~~36,954~~	1				1
			Woodchipper ~~WC88 8" Wood chipper (Inc. Spare Parts Kit)~~	50004020**4209.67**	5000 ~~4,020 4209.67~~	- -	- -	- -		1		5000 ~~4,0204210~~	1				1
			Compost tea brewer 20 litres (Sunsun Airblower 350Lpm) (incl soil testing kit)~~Compost tea brewer (HAP - 60 Hailea Air Pump, BYO Aeration kit)~~	405**309.01**	405 ~~309.01~~	- -	- -	- -		1		405 ~~309~~	~~-~~ 1				1
			Microscope (Optico ZSX-107T Soil	2000~~935~~**92.10**	2000~~935~~ ~~92.10~~	- -	- -	- -		1		2000~~935~~92	1				1

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			Biology Microscope) **(Bundle with camera, adapter and soil test kit.)**														
			ReoTemp compost Thermomenter (HD) with handle~~XSZ 107T soil biology microscope bundle (with microbes Identification poster and Refractometer - brix meter)~~	205~~**1,088.91**~~	205~~1,088.91~~	-	-	-		1		~~1,089~~205	1				1
			Mulch bales/ 10M3 a month of compost 120 bales a month x 12 month = 1440 bales = JD 5760 ~~Mulch bales~~	5000~~8140~~ ~~**13,692.55**~~	12502~~035~~ ~~3,423.13~~	12502~~035~~ ~~3,423.13~~	12502~~035~~ ~~3,423.13~~	12502035 ~~3,423.13~~		~~**5042.3**~~ ~~**948**~~	-	24 ~~**285**~~	12~~1~~ ~~**2**~~	12~~1~~ ~~**2**~~	12~~1~~ ~~**2**~~	12~~1~~ ~~**2**~~	48~~4~~ ~~**8**~~
			Manure (truck load) every truck of mulch need truck off manure 2 truck a month 24 a year 96 for 4 years ~~= 768 truck = 9600JD~~Manure ~~(truck load)~~	800~~13,540~~ ~~**9,600**~~	2000~~2,740~~ ~~**2,400**~~	2000~~3,600~~ ~~**2,400**~~	2000~~3,600~~ ~~**2,400**~~	2000~~3,600~~ ~~**2,400**~~		~~**4,116**~~4 ~~**8**~~	-	42~~75~~ ~~**200**~~	12~~8~~ ~~**12**~~	12~~1~~ ~~**2**~~	12~~1~~ ~~**2**~~	12~~1~~ ~~**2**~~	48~~4~~ ~~**48**~~
			Diesel average per litre~~Diesel~~	880 ~~**4,128**~~	160 ~~**1,032**~~	240 ~~**1,032**~~	240 ~~**1,032**~~	240 ~~**1,032**~~		105~~**48**~~	-	24 ~~**86**~~	8~~**12**~~	12~~1~~ ~~**2**~~	12~~1~~ ~~**2**~~	12~~1~~ ~~**2**~~	44~~4~~ ~~**8**~~
		Crop Garden and Compost Egg laying Chickens	1 Poly tunnel Inc. optional doors, and transportation to suggested sites ~~JUST)~~	9450 ~~**3,313.63**~~	9,450 ~~3,313.63~~	-	-	-		31	-	3,150 ~~3,314~~	11	-	-	-	11
			Irrigation	550	550					1		550	1				1
			Chickens: 10JD per chicken =30 chicken = 300JD x 3 (exchange after two years) = 600 JOD	850	425		425			1		425	1		1		2
			Hand tools, 2 wheelbarrows, 2 rakes, 2 shovels, 2 hoes, 2 pruners, 2 loppers, 2 pruning saws, 2 pitch forks~~Hand tools, 2 wheelbarrows, 2~~	300 ~~**300**~~	300 ~~300~~	-	-	-		1		300	1				1

			~~rakes, 2 shovels, 2 hoes, 2 pruners, 2 loppers, 2 pruning saws, 2 pitch forks~~														
			Seeds and Seedslings	**720**	180	180	180	180		4		180	1	1	1	1	4
			Fencing	**1,000**	1,000					1		1,000	1				
		~~Bees: Apiculture For 3 full hives~~ ~~Bees: Apiculture~~	~~Feed for 30 chicken~~3 flow ~~hives; 3 colonies: 3 hives full of bees; =450 JD stainless steel spinner extractor: = 750 JD smoker; = 15JD seperator: 3 top boxes: = 45JD brush; =5JD , 2suit: = 60JD, 2gloves; =14JD wax capping knife 5=JD Total for just 3 full hives 1344JD1 flow hives 2 hives full of bees (Local); stainless steel spinner extractor; smoker; separator; 1 top boxes; brush; 2 suits; gloves; wax capping knife~~	1,695 6025**3,254.20 700**	423 ~~6025~~ 3,254.20 ~~700~~	423 - -	423 - -	426 - -		11 ~~1~~		~~3,254~~ 700423602 ~~5~~	1 ~~1~~	1	1	1	41 ~~1~~
	Compost worms: vermicompost ~~Compost worms: vermicompost~~	~~2 sub-pod ,~~ 3 bath-tub worm farms~~1 Subpod worm farms (Inc. 1 Aerators)~~	300~~750~~ **601.72**	300~~750~~ ~~601.72~~	- -	- -	- -		1		602300~~750~~	1				1	
	Olive Orchard Monoculture Conversion to Food Forest (1,000m2)	Irrigation~~Irrigation~~	**~~550~~580**	550580	- -	- -	- -		11	-	550580	11	-	-	-	11	
		~~Chicken Caravan 30, 4 electric fences, 2 live gate, Gallagher S200 Solar Fence Energizer Chicken caraven 30, electric net fence, solar electric energiser~~	4960 **8,364.44**	4,960 ~~8,364.44~~	- -	- -	- -		~~1~~		8,364~~1960~~	~~1~~				~~1~~	
		~~Feed for 30 chickens 10JD per chicken =30 chicken = 300JD for 4 years 1200JD~~Feed for 30 chickens	~~1695~~**4,096**	~~423~~1,024	~~423~~1,024	~~423~~ 1,024	~~426~~ 1,024		~~1~~	-	1,024	~~1~~	~~1~~	~~1~~	~~1~~	4	

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			30 Chickens	340	340				1		340	1				1
			TreesTrees	720 720	180 180	180 180	180 180	180 180	1		180	1	1	1	1	4
			Seeds Seeds	300 300	75 75	75 75	75 75	75 75	1		7575	1	1	1	1	4
	Technical supportTechnical support	Supervision Permeculture demonstration site installation and maintenanceSupervision Permeculture demonstration site installation and maintenance	Permaculture expert (National)Permaculture expert (National)	120,000 192,928.5	48,000 64,303.5	24,000 42,875	24,000 42,875	24,000 42,875	11	-	2,000 2,679	242 4	121 2	121 2	121 2	606 0
			Agriculture labourers (National)Agriculture labourers (National)	57,600 28,800	14,400 7,200	14,400 7,200	14,400 7,200	14,400 7,200	22	-	600 300	121 2	121 2	121 2	121 2	484 8
			Strategic advise / expert (International)	42,70040,000	22,00024,400	6,000100	6,000100	6,000100	1	-	6,000100	3,664	1	1	11	3,667
			Permaculture systems advisor (international)	40,00042,700	22,00024,400	6,0006,100	6,0006,100	6,0006,100	1	-	6,0006,100	3,664	1	1	1	3,667
			Overhead/Research (Local University)	25,046	6,263	6,261	6,261	6,261	1		6,261	1	1	1	1	4
Sub-total				387,2752384,046 346,929.64	200,590214,001 171,762.22	61,00957,756 58,389.13	61,43457,756 58,389.13	61,01257,762 58,389.13								
Output 3.9. Permaculture demonstration - closed loop water system in Lebanon	Phase 3: Implement (concrete measures)	Agricultural Waste Management for Sustainable Crop Production (UNICEF)	Tractors Massey Ferguson (3)	**90,000**	90,000	-	-	-	3		30,000	1				1
			Medium sized Compost Turners (6)	**30,000**	30,000	-	-	-	6		5,000	1				1
			Woodchippers (3)	**12,000**	12,000	-	-	-	3		4,000	1				1
			Pruning Tools for Farmers (16)	**3,200**	3,200	-	-	-	16		200	1				1
			Mulch, 25 bales per month ($3.6/bale)	**4,320**	1,080	1,080	1,080	1,080	25		3.6	12	12	12	12	48
			Manure truck load, 2 per month	**7,200**	1,800	1,800	1,800	1,800	2		75	12	12	12	12	48
			Diesel average ($1.5/L; 960L/year)	**11,520**	2,880	2,880	2,880	2,880	3		80	12	12	12	12	48
			Compost tea brewers 20 litres (3)	**6,000**	6,000	-	-	-	3		2,000	1				
			Scoop Shovels (16)	**480**	480	-	-	-	16		30	1				
			Pitchforks (16)	**480**	480	-	-	-	16		30	1				
			Lab materials and kits for in-lab analysis/testing (1 set)	**5,000**	5,000	-	-	-	1		5,000	1				
			Woodbeds for biofertilizer fermentation (16)	**960**	960	-	-	-	16		60	1				

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		Subpod worm farms (10)	**2,000**	2,000	-	-	-		10		200	1					
	Urban, Peri-Urban and Rural Agriculture and Water Harvesting as Adaptation Measures (UNICEF)	11 Mobile Coop Systems, electric fences, solar electric energiser	**33,000**	-	16,500	16,500	-		11		3,000		0.5	0.5		1
		Installation of RW harvesting System + Irrigation Systems (10)	**13,500**	-	6,750	6,750	-		10		1,350		0.5	0.5		1
		Feed for 55 chickens per year, $300/ 5 chickens/ year (11)	**3,300**	-	1,650	1,650	-		11		300		0.5	0.5		1
		Hand tools, wheelbarrows, rakes, shovels, hoes, pruners, loppers, pruning saws, pitch forks (11 each)	**2,750**	-	2,750	-	-		11		250		1			1
		Seeds and Seedlings per year, $1,800/year (4 years, 10 farmers)	**7,200**	-	3,600	3,600	-		2		1,800		1	1		2
		Vertical farming tools (30 systems distributed between urban and peri-urban contexts)	**4,500**	-	2,250	2,250	-		30		150		0.5	0.5		1
	Apiculture and the reduction of chemical substance use at farm level (UNICEF)	Flow Hives (5)	**3,500**	-	3,500	-	-		5		700		1			1
		Colonies (5)	**850**	-	850	-	-		5		170		1			1
		Hives full of Bees (5)	**1,800**	-	1,800	-	-		5		360		1			1
		Stainless Steel Spinner Extractors (5)	**1,800**	-	1,800	-	-		5		360		1			1
		Smokers (5)	**110**	-	110	-	-		5		22		1			1
		Separators (5)	**23**	-	23	-	-		5		4.5		1			1
		Top boxes (5)	**240**	-	240	-	-		5		48		1			1
		Brush (5)	**30**	-	30	-	-		5		6		1			1
		Suit (5)	**180**	-	180	-	-		5		36		1			1
		Gloves (5)	**58**	-	58	-	-		5		12		1			1
		Wax capping knife (5)	**125**	-	125	-	-		5		25		1			1
		Constructing greenhouse/ecological charact. (4)	**32,000**	-	32,000	-	-		4		8,000		1			1
		Maintenance to LARI's existing greenhouse (1)	**3,000**	-	3,000	-	-		1		3,000		1			1
	Introducing adapted crop varieties and	Irrigation Systems (5)	**1,750**	-	1,750	-	-		5		350		1			1

		diversifying farm production (UNICEF)	Manure Systems (5)	**750**	-	750	-	-		5		150		1			1
			Intercropping Systems (different types of fruit trees/legumes plantations) + New fruit trees adapted varieties for 5000 sqm (5; three seasons)	**9,000**	3,000	3,000	3,000	-		5		600	1	1	1		3
			Fodder plant seeds, legumes seeds, other plant seeds (5)	**300**	-	300	-	-		5		60		1			
	Technical support	Supervisision Permaculture demonstration site installation and maintenance	Permaculture expert (International) (80%)	**115,200**	28,800	28,800	28,800	28,800		0.8		3,000	12	12	12	12	48
			Agriculture labourers (National)	**55,200**	13,800	13,800	13,800	13,800		2		575	12	12	12	12	48
			Project Management Assistant (National) (80%)	**57,600**	14,400	14,400	14,400	14,400		0.8		1,500	12	12	12	12	48
			Senior strategic project management systems expert & permaculture systems advisor (National) (80%)	**172,800**	43,200	43,200	43,200	43,200		0.8		4,500	12	12	12	12	48
			UNICEFoperation costs (80%)	**96,000**	24,000	24,000	24,000	24,000		0.8		2,500	12	12	12	12	48
		Sub Project Coordination (RTO)	Sub Project coordination and supervision (80%)	**96,000**	24,000	24,000	24,000	24,000		0.8		2,500	12	12	12	12	48
Sub-total				**885,725**	**307,080**	**236,975**	**187,710**	**153,960**										
TOTAL Component 3				**7,**~~473,650,645~~14,707	~~540,184~~ 613,283	~~4,739,136~~ 5,168,996	~~1,945,643~~ 1,125,242	**246,**~~000~~677										
Output 4.1. Regional / international KM with focus on project lessons sharing and replication (incl. international seminars and regional platforms & policy dialogue)		UN- ESCWA seminars and knowledge sharing in Jordan or Lebanon: targeting regional steering committee members (national and city government officials) to participate	See output 4.2 (SC members travel)	**-**	**-**	**-**	**-**	**-**										0

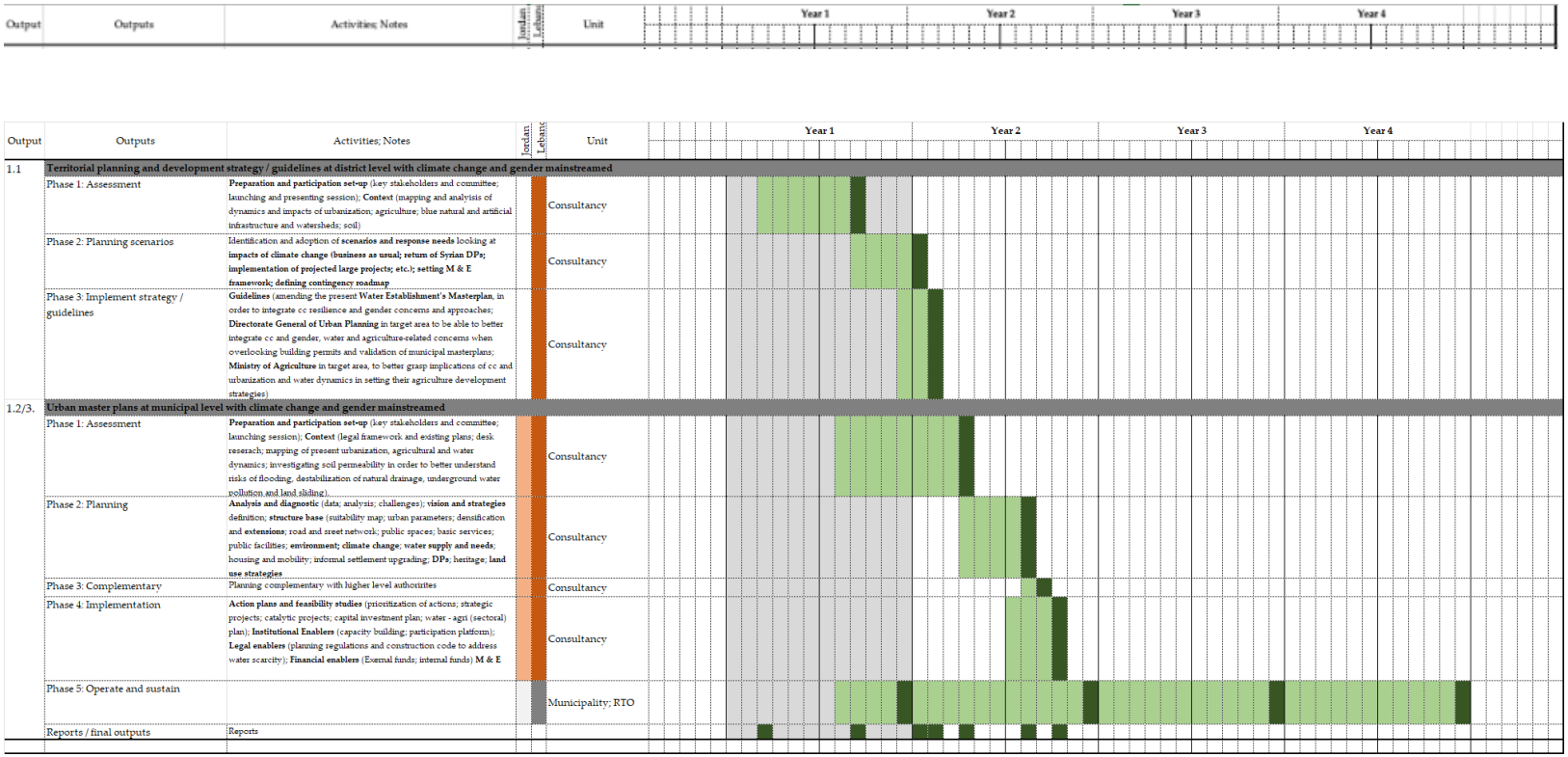
		Regional workshops and International seminars / events focused specifically on climate change and urban development, incl. refugee crisis implications (AMFHUD ; WUF, COP side events (2x); AFSD; HLPF 2022 reviewing SDG 11 and 6 and HLPD 2023): targeting regional steering committee members (national and city government officials) + other key stakeholders to participate	Regional workshops and International seminars / events focused on climate change, urban development and refugee crisis implications (incl. travel and daily allowance for accommodation, etc.)	**200,000**	25,000	25,000	75,000	75,000		10		2,500	1	1	3	3	8
		Through Arab Centre for Climate Change Policies; set-up community of practices on climate change in urban areas with implications refugee crisis (with documentation of good practices and lessons; replication package; project video; knowledge products uploaded) linked to ACCCP knowledge platform	Communication outputs (publications, digital platform, video: project baseline and results, incl. human interest story)	**80,000**	20,000	10,000	20,000	30,000		1		10,000	2	1	2	3	8
		For all above:	see output 4.2 (communication officer)	**-**	**-**	**-**	**-**	**-**									0
Sub-total				**280,000**	**45,000**	**35,000**	**95,000**	**105,000**									
Output 4.2. Jordan and Lebanon KM with focus on project progress, best practices and lessons learned shared + capacity building		Jordan and Lebanon Project Steering committee meetings in Lebanon or Jordan (to align with ESCWA relevant events - see 4.1.)	SC workshop organisation	**64,000**	16,000	16,000	16,000	16,000		1		8,000	2	2	2	2	8
		Platform / working space (electronic) used for project communication and sharing lessons (research; project best practice and lessonse learned, incl. field visits)	SC travel and daily allowance for accommodation, etc. (also covering exchange visits and ESCWA events as side	**184,400**	55,320	36,880	36,880	55,320		20		922	3	2	2	3	10

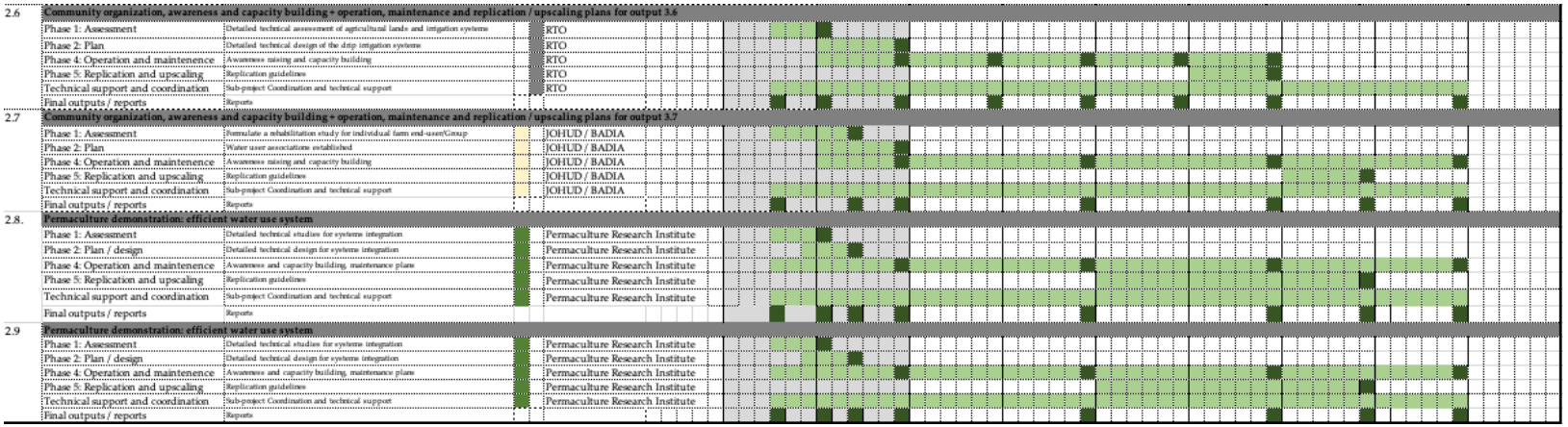
			events - see 4.1., where possible)														
			Project field visits	**18,000**	2,000	4,000	6,000	6,000		1		2,000	1	2	3	3	9
		For all above:	Communication officer (see above)	**155,400**	33,300	44,400	33,300	44,400		1		3,700	9	12	9	12	42
		For all above:	Admin / travel support	**16,000**	4,000	4,000	4,000	4,000		1		2,000	2	2	2	2	8
Sub-total				**437,800**	**110,620**	**105,280**	**96,180**	**125,720**									
Output 4.3. Sub-national KM and Regional' urban risks and vulnerabilities assessment, planning and management approach model for type 2 cities		Institutional set-up territorial observatories (in universities) in target areas	Spatial / urban planner	**28,000**	-	28,000	-	-		2		3,500		4			4
			IT expert	**20,000**	-	20,000	-	-		2		2,500		4			4
		Geo-referenced database and an online platform to share data produced and linked with ESCWA database	Database	**60,000**	-	20,000	20,000	20,000		2		10,000		1	1	1	3
		Regional' urban risks and vulnerabilities assessment, planning and management approach model for type 2 cities (including replication guidelines and online module)	Climate Change Expert	**21,000**				21,000		1		3,500				6	6
			Spatial / urban planner	**21,000**	-	-	-	21,000		1		3,500				6	6
			Communication / publication	**15,000**	-	-	-	15,000		1		15,000				1	1
Sub-total				**165,000**	**-**	**68,000**	**20,000**	**77,000**									
Output 4.4. Incentive mechanism (financial) and regulatory framework to replicate and upscale rainwater harvesting activities		Identification of effective incentive mechanism (financial) and regulatory framework to repliacte and upscale (i.e. national programme) rainwater harvesting activities, esp. in Jordan	Consultant	**36,000**	-	-	36,000	-		1		6,000			6		6
		Travel	2 missions	**4,362**	-	-	-	4,362		2		2,181				1	1
Sub-total				**40,362**	**-**	**-**	**36,000**	**4,362**									

TOTAL Component 4				**923,162**	**155,620**	**208,280**	**247,180**	**312,082**										
TOTAL Components				11,655,600	~~2,041,248~~2,064,899	~~5,935,703~~6,598,261	~~2,763,660~~2,076,907	~~914,989~~915,532										
Project execution costs																		
Project execution		Jordan	Regional Project coordination (regional - international)	**264,000**	66,000	66,000	66,000	66,000		1		11,000	6	6	6	6	**24**
			Admin / financial procurement (regional - national)	**63,000**	15,750	15,750	15,750	15,750		1		1,750	9	9	9	9	**36**
			M & E and communication (regional - national)	**36,000**	9,000	9,000	9,000	9,000		1		1,500	6	6	6	6	**24**
			Safeguarding system (AF) compliance (regional - national)	**36,000**	9,000	9,000	9,000	9,000		1		1,500	6	6	6	6	**24**
			Engineer water / cc focused (regional - national)	**99,000**	36,000	27,000	18,000	18,000		1		3,000	12	9	6	6	**33**
			National Project coordination/Urban Planner (national)	**180,000**	45,000	45,000	45,000	45,000		1		5,000	9	9	9	9	**36**
			Driver (national)	**16,800**	4,200	4,200	4,200	4,200		1		1,400	3	3	3	3	**12**
		Travel	Related to Jordan staff travel	**21,810**	6,543	4,362	4,362	6,543		1		2,181	3	2	2	3	**10**
		Lebanon	National Project coordination/Urban Planner (national)	**180,000**	45,000	45,000	45,000	45,000		1		5,000	9	9	9	9	**36**
			Water Engineer (regional - national)	**108,000**	36,000	36,000	18,000	18,000		1		3,000	12	12	6	6	**36**
			Admin / procurement (regional - national)	**63,000**	15,750	15,750	15,750	15,750		1		1,750	9	9	9	9	**36**
			Communication (national)	**28,800**	7,200	7,200	7,200	7,200		1		2,400	3	3	3	3	**12**
			Driver (national)	**16,800**	4,200	4,200	4,200	4,200		1		1,400	3	3	3	3	**12**
		Travel	Related to Lebanon travel	**16,000**	4,000	4,000	4,000	4,000		1		500	8	8	8	8	**32**
		Operations	Vehicle Operations & Maintenance	**12,000**	3,000	3,000	3,000	3,000		2		250	6	6	6	6	**24**
			Office Rent	**32,000**	8,000	8,000	8,000	8,000		2		2,000	2	2	2	2	**8**
			Communication	**13,000**	1,000	1,000	1,000	10,000		1		1,000	1	1	1	10	**13**
			Office Supplies and Stationery	**12,000**	3,000	3,000	3,000	3,000		2		250	6	6	6	6	**24**

		Final evaluation	Independent (lump sum)	**25,000**	-	-	-	25,000		1		25,000				1	**1**
TOTAL Execution costs				**1,223,210**	**318,643**	**307,462**	**280,462**	**316,643**									
TOTAL Project costs				**12,878,810**	2,359,8912,383,542	6,243,1656,905,723	3,044,1222,357,369	**1**,231,6322,232,175									
Project cycle management fee costs																	
Project cycle management		**1.25%**	UN-H ROAS overall project supervision, incl. AF and UN-H policies (esp ESP and GP) and regulations compliance and regional admin, coordination and travel	160,985	29,499794	78,04086,322	38,05129,467	15,395402									
		0.25%	UN-H ROAS M & E, incl. Travel	32,197	5,900 959	15,60817,264	7,6105,893	3,079080									
		7%	UN-H HQ Overall project supervision, incl .compliance to UN-H policies (gender, human rights, climate change, etc.)	901,517	165,192166,848	437,022483,401	213,089165,016	86,214252									
TOTAL management fee		**8.50%**		1,094,699	200,591202,601	530,670586,986	258,750200,376	104,688735									
TOTAL amount of financing requested				**13,973,509**	2,560,4822,586,143	6,773,8357,492,709	3,302,8722,557,745	**1,336**,,320910									

ANNEX 7: Milestones





2.6	**Community organization, awareness and capacity building + operation, maintenance and replication / upscaling plans for output 3.6**		
	Phase 1: Assessment	Detailed technical assessment of agricultural lands and irrigation systems	RTO
	Phase 2: Plan	Detailed technical design of the drip irrigation systems	RTO
	Phase 4: Operation and maintenence	Awareness raising and capacity building	RTO
	Phase 5: Replication and upscaling	Replication guidelines	RTO
	Technical support and coordination	Sub-project Coordination and technical support	RTO
	Final outputs / reports	Reports	
2.7	**Community organization, awareness and capacity building + operation, maintenance and replication / upscaling plans for output 3.7**		
	Phase 1: Assessment	Formulate a rehabilitation study for individual farm end-user/Group	IOHUD / BADIA
	Phase 2: Plan	Water user associations established	IOHUD / BADIA
	Phase 4: Operation and maintenence	Awareness raising and capacity building	IOHUD / BADIA
	Phase 5: Replication and upscaling	Replication guidelines	IOHUD / BADIA
	Technical support and coordination	Sub-project Coordination and technical support	IOHUD / BADIA
	Final outputs / reports	Reports	
2.8.	**Permaculture demonstration: efficient water use system**		
	Phase 1: Assessment	Detailed technical studies for systems integration	Permaculture Research Institute
	Phase 2: Plan / design	Detailed technical design for systems integration	Permaculture Research Institute
	Phase 4: Operation and maintenence	Awareness and capacity building, maintenance plans	Permaculture Research Institute
	Phase 5: Replication and upscaling	Replication guidelines	Permaculture Research Institute
	Technical support and coordination	Sub-project Coordination and technical support	Permaculture Research Institute
	Final outputs / reports	Reports	
2.9	**Permaculture demonstration: efficient water use system**		
	Phase 1: Assessment	Detailed technical studies for systems integration	Permaculture Research Institute
	Phase 2: Plan / design	Detailed technical design for systems integration	Permaculture Research Institute
	Phase 4: Operation and maintenence	Awareness and capacity building, maintenance plans	Permaculture Research Institute
	Phase 5: Replication and upscaling	Replication guidelines	Permaculture Research Institute
	Technical support and coordination	Sub-project Coordination and technical support	Permaculture Research Institute
	Final outputs / reports	Reports	


2.1
Community organization, awareness and capacity building + operation, maintenance and replication / upscaling plans for output 3.1
Phase 1: Assessment
Detailed technical assessment of target buildings
UNICEF
Phase 2: Plan
Detailed technical design of systems
UNICEF
Phase 4: Operation and maintenance
Awareness raising and capacity building
UNICEF
Phase 5: Replication and upscaling
Replication guidelines
UNICEF
Technical support and coordination
Sub-project Coordination and technical support
UNICEF
Final outputs / reports
Reports
2.2
Community organization, awareness and capacity building + operation, maintenance and replication / upscaling plans for output 3.2
Phase 1: Assessment
Detailed technical assessment of target buildings
IOHUD
Phase 2: Plan
Detailed technical design of systems
IOHUD
Phase 4: Operation and maintenance
Awareness raising and capacity building
IOHUD
Technical support and coordination
Sub-project Coordination and technical support
IOHUD
Final outputs / reports
Reports
2.3.
Community organization, awareness and capacity building + operation, maintenance and replication / upscaling plans for output 3.3
Phase 1: Assessment
Detailed technical assessment of target buildings
UNICEF
Phase 2: Plan
Detailed technical design of systems
UNICEF
Phase 4: Operation and maintenance
Awareness raising and capacity building
UNICEF
Phase 5: Replication and upscaling
Replication guidelines
UNICEF
Technical support and coordination
Sub-project Coordination and technical support
UNICEF
Final outputs / reports
Reports
2.4.
Community organization, awareness and capacity building + operation, maintenance and replication / upscaling plans for output 3.4.1
Phase 1: Assessment
Detailed technical assessment of the irrigation canal and agricultural areas
UNICEF + RTO
Phase 2: Plan
Detailed technical design of the open canal
UNICEF + RTO
Phase 4: Operation and maintenance
Surveys and studies developed for understanding adaptation measures
UNICEF + RTO
Awareness raising and capacity building to operate and maintain
UNICEF + RTO
Phase 5: Replication and upscaling
Replication guidelines
UNICEF + RTO
Technical support and coordination
Sub-project Coordination and technical support
RTO
Final outputs / reports
Reports
2.5
Community organization, awareness and capacity building + operation, maintenance and replication / upscaling plans for output 3.5
Phase 4: Operation and maintenance
Operation & maintenance plans for proposed interventions
WAJ/YARMOUK
Phase 5: Replication and upscaling
Replication guidelines
WAJ/YARMOUK
Final outputs / reports
Reports
2.6
Community organization, awareness and capacity building + operation, maintenance and replication / upscaling plans for output 3.6
Phase 1: Assessment
Detailed technical assessment of agricultural lands and irrigation systems
UNICEF + RTO
Phase 2: Plan
Detailed technical design of the drip irrigation systems
UNICEF + RTO
Phase 4: Operation and maintenance
Awareness raising and capacity building
UNICEF + RTO
Phase 5: Replication and upscaling
Replication guidelines
UNICEF + RTO
Technical support and coordination
Sub-project Coordination and technical support
RTO
Final outputs / reports
Reports
2.7
Community organization, awareness and capacity building + operation, maintenance and replication / upscaling plans for output 3.7
Phase 1: Assessment
Formulate a rehabilitation study for individual tank and user Group
IOHUD / BADIA
Phase 2: Plan
Water user associations established.
IOHUD / BADIA
Phase 4: Operation and maintenance
Awareness raising and capacity building
IOHUD / BADIA
Phase 5: Replication and upscaling
Replication guidelines
IOHUD / BADIA
Technical support and coordination
Sub-project Coordination and technical support
IOHUD / BADIA
Final outputs / reports
Reports
2.8.
Permaculture demonstration: efficient water use system
Phase 1: Assessment
Detailed technical studies for systems integration
Permaculture Research Institute
Phase 2: Plan / design
Detailed technical design for systems integration
Permaculture Research Institute
Phase 4: Operation and maintenance
Awareness and capacity building, maintenance plans
Permaculture Research Institute
Phase 5: Replication and upscaling
Replication guidelines
Permaculture Research Institute
Technical support and coordination
Sub-project Coordination and technical support
Permaculture Research Institute
Final outputs / reports
Reports
2.9
Permaculture demonstration: efficient water use system
Phase 1: Assessment
Detailed technical studies for systems integration
UNICEF
Phase 2: Plan / design
Detailed technical design for systems integration
UNICEF
Phase 4: Operation and maintenance
Awareness and capacity building, maintenance plans
UNICEF
Phase 5: Replication and upscaling
Replication guidelines
UNICEF
Technical support and coordination
Sub-project Coordination and technical support
UNICEF
Final outputs / reports
Reports


3.1 Rooftop Rain Water Harvesting (RWH) in Lebanon + show room
Phase 3: Implementation
Install and connect 20 large RWH systems
UNICEF
Show room (1) with rainwater harvesting system and Water Saving
UNICEF
Technical support
Engineering /technical supervision,installation and maintenance
UNICEF
Final outputs / reports
Reports
3.2 Rooftop Rain Water Harvesting (RWH) in Jordan + show room
Phase 3: Implementation
Install and connect 84 small RWH systems
JOHUD
Show room (2) with RWH system, GWTS system and Water Saving
JOHUD
Technical support
Engineering /technical supervision,installation and maintenance
JOHUD
Final outputs / reports
Reports
3.3. Grey Water Treatment and Reuse (GWTS) in Jordan
Phase 3: Implementation
Install / construct and connect 40 GWTS systems
UNICEF
Rehabilitation and modification of WASH blocks for greywater reuse in
UNICEF
Technical support
Engineering /technical supervision,installation and maintenance
UNICEF
Final outputs / reports
Reports
3.4. Efficient treatment and reuse of wastewater from Zahle WWTP, in Lebanon
Phase 3: Implementation
Reuse of the Zahle WWTP effluent for irrigation - 3000 m channel
UNICEF
Technical support
Engineering /technical supervision,installation and maintenance
RTO
Final outputs / reports
Output report
3.5 Efficient treatment and reuse of wastewater in Jordan
Phase 3: Implementation
Maetad WWTP upgrading for increased water quality and water storage
WAJ / YARMOUK
Al Alalder WWTP upgrading for increased water quality and water
WAJ / YARMOUK
Mafraq WWTP upgrading for increased water quality for irrigation
WAJ / YARMOUK
Technical support
Engineering /technical supervision,installation and maintenance
WAJ / YARMOUK
Final outputs / reports
Reports
3.6. Water-use-efficient irrigation of treated wastewater for fruit trees in Lebanon from Zahle WWTP, Lebanon
Phase 3: Implementation
Installation of drip irrigation systems (110 out of possible 116 ha) for fruit
UNICEF
Technical support
Engineering /technical supervision,installation and maintenance
UNICEF + RTO
Final outputs / reports
Reports
3.7.1 Water-use Efficient irrigation of treated wastewater from Maetad and Alkalder WWTPs in Jordan
Phase 3: Implementation
Connect WWTPs stored water with farm lands - 4 km pipeline
JOHUD
Establish a new modern water irrigation system for 120 durum
JOHUD
Technical support
Engineering /technical supervision,installation and maintenance
JOHUD
Final outputs / reports
Reports
JOHUD
3.7.2 Water-use Efficient irrigation of treated wastewater from Mafraq WWTP in Jordan
Phase 3: Implementation
Establish a new modern water irrigation system for 100 durum
BADIA
Establish new water ponds (15)
BADIA
Technical support
Engineering /technical supervision,installation and maintenance
BADIA
Final outputs / reports
Reports
3.8. Permaculture: Permaculture demonstration in Jordan
Phase 3: Implementation
Bio-Fertilizer production
Permaculture Research Institute
Crop Garden and Compost Egg laying Chickens
Permaculture Research Institute
Bees Apiculture
Permaculture Research Institute
Compost worms: vermicompost
Permaculture Research Institute
Olive Orchard Monoculture Conversion to Food Forest (1,000m2)
Permaculture Research Institute
Technical support
Engineering /technical supervision,installation and maintenance
Permaculture Research Institute
Final outputs / reports
Reports
3.9 Permaculture: Permaculture demonstration in Lebanon
Phase 3: Implementation
Bio-Fertilizer production
UNICEF
Crop Garden and Compost Egg laying Chickens
UNICEF
Bees Apiculture
UNICEF
Compost worms: vermicompost
UNICEF
Olive Orchard Monoculture Conversion to Food Forest (1,000m2)
UNICEF
Technical support
Engineering /technical supervision,installation and maintenance
UNICEF + RTO
Final outputs / reports
Reports

4.1.	**Regional / international KM**		
	With focus on sharing project lessons replication (incl. international seminars and regional platforms & policy dialogue)	UN- ESCWA seminars and knowledge sharing in Jordan or Lebanon:	UN-ESCWA
		International seminars / events focused specifically on climate change and	UN-ESCWA
		Through Arab Centre for Climate Change Policies; creation of community of practices on climate change in urban areas with implications refugee crisis (with documentation of good practices and lessons; replication package; project video; knowledge products uploaded	UN-ESCWA
	Final outputs / reports	Reports	
4.2.	**Jordan and Lebanon KM**		
	With focus on project progress, best practices and lessons learned shared + capacity building of government stakeholders	Jordan and Lebanon Project Steering committee meetings in Lebanon or Jordan (to align with ESCWA relevant events - see 4.1.)	UN-ESCWA
		Platform/working space (electronic) set-up and used for communication and sharing lessons regarding the project (research; project best practice and lessons learned, incl. field visits);	UN-ESCWA
	Final outputs / reports	Reports	
4.3.	**Sub-national KM**		
	With focus on Regional' urban risks and vulnerabilities assessment, planning and management approach **model for type 2 cities**	Institutional set-up territorial observatories (in universities) in target areas	Consultancy
		Geo-referenced database and an online platform to share data produced	Consultancy
		Regional' urban risks and vulnerabilities assessment, planning and management approach model for type 2 cities - the model to take into account climate change and DP crisis related urban water scarcity challenges.	Consultancy
	Report, model and guidelines	Report and model, including replication guidelines	
4.4.	**Incentive mechanism (financial) and regulatory framework to replicate and upscale rainwater harvesting activities**		
		Identification effective incentive mechanism (financial) and regulatory framework to replicate and upscale (i.e. National programme) rainwater harvesting activities, esp. in Jordan	Consultancy
	Final outputs / reports	Report, incl. of incentive mechanism applicable in Jordan and the region.	

UN-Habitat
Consultancy / private sector (Lebanon)
Consultancy / private sector (Jordan)
Municipality
UNICEF Lebanon + Jordan
RTO Lebanon
UNICEF + RTO
JOHUD Jordan
BADIA Jordan
WAJ / YARMOUK Jordan
Permaculture Research Institute Jordan
UNESCWA Lebanon