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LOCALLY-LED ADAPTATION SINGLE COUNTRY PROPOSAL FOR LEBANON



ADAPTATION FUND

ADAPTATION FUND BOARD SECRETARIAT
TECHNICAL REVIEW OF PROJECT PROPOSAL FOR
"NATURE-BASED WATER MANAGEMENT & DATA-DRIVEN STRATEGY FOR CLIMATE
RESILIENCE IN AKKAR, LEBANON"

Project Title Nature-based Water Management & Data-Driven Strategy for Climate Resilience in Akkar, Lebanon

Project ID AF00000446

Category LLA

Type Single country project

Stage Concept

Country Lebanon

Implementing Entity UNHAB

Financing Requested USD 5,000,000.00

Reviewer Linda Ogallo

Co-reviewer(s)

IE Contact Person

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Secretariat's Overall Comment

The project Nature-based Water Management & Data-Driven Strategy for Climate Resilience in Akkar, Lebanon aims to enhance climate resilience and water security in Akkar, Lebanon, through a data-driven and nature-based approach that empowers local institutions and communities to lead adaptation efforts. The proposal includes a request for a project formulation grant and/or project formulation assistance grant of USD 200,000. The initial technical review raises several issues, such as the balance between data systems and concrete adaptation on the ground, the deferral of the mechanisms for devolving decision-making and finance to local actors, the absence of vulnerable groups in the risk screening, incomplete mapping of overlapping initiatives and coordination arrangements, unsubstantiated benefit figures, and the incorrectly completed ESP checklist and missing risk categorisation, as is discussed in the number of Clarification Requests (CRs) and Corrective Action Requests (CARs) raised in the review.

Country Eligibility

Is the country party to the Kyoto Protocol and/or the Paris Agreement?

Response: Yes

Secretariat: Yes, Lebanon is a party to the Kyoto Protocol.

Is the country a developing country particularly vulnerable to the adverse effects of climate change?

Response: Yes

Secretariat: Lebanon is a developing country Party and is particularly vulnerable to the adverse effects of climate change, including rising temperatures, declining and increasingly variable precipitation, water scarcity, drought, and coastal impacts. These vulnerabilities are compounded by economic fragility and pressure on water resources and agricultural livelihoods, which is consistent with the project's focus on water management and climate resilience in Akkar.

Project Eligibility

Has the designated government authority for the Adaptation Fund endorsed the project/programme?

Response: Yes

Secretariat: As per the letter dated July 5, 2025

Does the length of the proposal amount to no more than fifty (50) pages for the Concept note project document, including its annexes?

Response: Cleared

Secretariat: The proposal is 45 pages, including the annexes.

Does the project / programme support concrete adaptation actions to assist the country and/or the local actors in addressing adaptive capacity to the adverse effects of climate change and build in climate resilience?

Response: Not Cleared

Secretariat: Yes, but clarification is required. The concept note proposes a coherent three-component design combining a water monitoring network (Component 1), nature-based solutions for wastewater treatment and rainwater harvesting (Component 2), and capacity building (Component 3). Component 2 contains recognisably concrete adaptation activities (constructed wetlands, RWH systems on greenhouses), and the components are logically sequenced. However, the balance of the investment and the definition of the on-the-ground interventions are not yet sufficient to assess concreteness. CR 1: The distribution of resources across components appears weighted towards monitoring, data systems and modelling (Component 1, US\$ 2,197,800, or approximately 52% of activity costs) relative to on-the-ground adaptation measures (Component 2, US\$ 1,663,200). Please clarify how the proposed allocation delivers concrete adaptation benefits on the ground, and how the data generated will translate into adaptation outcomes for vulnerable communities within the project lifetime. CR 2: The scope of the concrete NbS interventions is expressed in indicative terms ("1–2 pilot villages", "reedbeds filters or any other proven nature-based solutions"), with site selection, technology choice and design deferred to the PFG phase. Please indicate the expected scale of the physical interventions (number and approximate size of systems, population served) to allow assessment of the adaptation benefits at concept stage. CR 3: Several quantified benefits are stated without a stated basis, for example, approximately 100,000 m³/year of wastewater treated, an estimated US\$200,000/year in avoided pumping costs, a 15% reduction in groundwater extraction in the targeted area, and more than 300,000 indirect beneficiaries. Please provide the basis for these figures. In addition, an estimate of the direct beneficiaries is not provided and should be included. CR 4: Component 1 activities substantially complement infrastructure already installed or planned by AFD, GIZ, the Netherlands-funded IHIS/EWS project, and the UNICEF GCF pipeline project. Please clarify which monitoring assets and functions will be financed by the Adaptation Fund, and how the adaptation additionality of this component is established relative to those investments.

Does the project/programme enable devolving decision making to the lowest appropriate level? Does it give local institutions and communities more direct access to finance and decision-making power over how adaptation actions are defined, prioritized, designed, implemented; how progress is monitored and how success is evaluated.

Response: Not Cleared

Secretariat: The concept note is explicitly framed around LLA principles and identifies plausible local actors. Positive elements include the proposed NLWE delegation of authority to municipalities under a public-public partnership for NbS O&M, municipal-led site selection and community mobilisation, co-design workshops for NbS technology choice, and grant-readiness/financial literacy training to enable municipalities to access climate finance directly. However, at present the devolution is largely stated as intent, with the operative mechanisms deferred to the full proposal stage. CR 5: The mechanisms for devolving decision-making authority and financial resources to local entities are consistently deferred ("UNICEF and its partners will further define the specific mechanisms...", "where the selected municipality(ies) express readiness"). Please indicate, at concept stage, the intended nature of these arrangements: including whether any funds will flow directly to municipalities or community structures, and the decisions over which local actors will hold authority rather than an advisory role. Please also clarify whether local communities and institutions will have a role in defining and weighting the criteria used to prioritise sites and adaptation options, given that co-design as described (p. 10) applies to technology and location within municipalities pre-selected against criteria set by the project team (pp. 9–10). Please also see CR 2. CR 6: The concept note states that community monitoring committees will hold "delegated authority" and that the SCADA/monitoring network will be a "locally owned and managed asset", while ownership of installed assets, data governance arrangements, and the respective decision rights of NLWE, municipalities and communities are not described. Please clarify these arrangements, including who holds authority over the data and over extraction-limit decisions arising from it. CAR 1: Part I identifies UN-Habitat as a National Implementing Entity. UN-Habitat is a Multilateral Implementing Entity. Please correct the entity type in Part I

Does the project / programme provide economic, social and environmental benefits, particularly to vulnerable communities, including gender considerations, while avoiding or mitigating negative impacts, in compliance with the Environmental and Social Policy and Gender Policy of the Fund? Does the project/programme address structural inequalities faced by women, youth, children, people with disabilities, people who are displaced, Indigenous Peoples and marginalized ethnic groups?

Response: Not Cleared

Secretariat: Yes, but clarification is needed. Section B sets out a plausible spread of economic, social and environmental benefits, and the participatory planning framework and community monitoring committees (p. 12) are appropriate at concept stage. Youth are well integrated across Components 2 and 3. The gender section (pp. 13–14) correctly identifies structural barriers in Lebanon; land ownership, decision-making authority, access to formal agricultural support; and a gender assessment is planned under the PFG. Mitigation of negative impacts is broadly outlined in Section E (pp. 16–17), including screening at each pilot site and an accessible grievance mechanism. The main gaps concern the treatment of displaced populations and persons with disabilities, and the fact that the proposed gender measures do not respond to the structural barriers the note itself identifies. CAR 2: ESP Principle 3 requires the IE, using disaggregated data where possible, to identify and quantify marginalized and vulnerable groups present, describe their characteristics, identify the adverse impacts each group is likely to experience taking account of their specific needs and constraints, and describe monitoring for disproportionate impacts as situations change; the guidance cites the arrival of refugees or IDPs as exactly such a case. Given that displacement is presented as a principal driver of water stress in Akkar (pp. 2–3), the current treatment of displaced populations and persons with disabilities as participants in consultation (pp. 11–13) does not meet this. Please identify the marginalized and vulnerable groups present in the target area, describe their characteristics, and indicate the impacts and benefits anticipated for each, including displaced populations and persons with disabilities. CAR 3: Benefits are concentrated in 1–2 pilot villages while more than 300,000 indirect beneficiaries are claimed (p. 13). In line with ESP Principle 2, please describe how access to

project benefits will be allocated, including the criteria that will govern selection of pilot locations and of households benefiting from RWH systems, and explain how benefits are expected to reach vulnerable groups beyond the pilot sites. Please also see CR 2, CR 3 and CR 5. The gender measures set out in the concept are largely participation-based. At full proposal stage, the gender assessment is expected to translate the structural barriers already identified in the concept note; particularly women's limited decision-making authority in water governance, into corresponding measures within the governance arrangements, alongside a gender action plan with gender-responsive indicators. Clarifying whether the 30% women's participation figure is a minimum or a target should be addressed at that stage.

Is the project / programme cost effective?

Response: Not Cleared

Secretariat: Yes, but clarification is required. Section C (pp. 14–15) provides a reasoned qualitative case in Lebanon's context. The retrofit of existing infrastructure and connection to the AFD-installed SCADA system rather than building parallel systems are sound cost-effectiveness choices. Sustainability-linked arguments are made through the public-public partnership for municipal O&M, capacity building of NLWE and municipalities, and grant-readiness training. The logic of the scope is coherently explained (p. 7). The weaknesses are that no initial thinking around alternative options, and that the sustainability case rests on assumptions that are asserted rather than tested. CR 7: Section C sets out the merits of the selected approach but does not present initial thinking on alternatives. Please indicate what alternative options were considered for achieving the intended adaptation outcomes; including at the level of scope, such as the choice of a governorate-wide monitoring network versus the single-watershed focus recommended during consultation (p. 19), and the reasoning behind the option selected. At the full proposal stage the comparative cost figures cited in Section C will need to be sourced, and indicative unit costs for the monitoring assets and NbS systems provided, to substantiate the cost-effectiveness case.

Is the project / programme consistent with national, sub-national or local sustainable development strategies, national, sub-national or local development plans, poverty reduction strategies, national communications and adaptation programs of action and other relevant instruments?

Response: Not Cleared

Secretariat: Yes, but some clarification is required. Section D (pp. 15-16) identifies the relevant instruments and maps each to specific components, with precise citation rather than generic alignment claims. The key adaptation instruments are covered. The NAP (2025) exists and is referenced, including Akkar's identification in the spatial prioritisation for water resources (Table 22) and the Rank 1 water intervention on cost-effective wastewater treatment and reuse prioritising NbS (Table 10), which corresponds directly to Component 2. The NDC 3.0 (2025) is referenced with Adaptation Priority 3 (Water), Guiding Principle 4 on NbS as a first line of defence, and Key Actions 4, 7 and 8, which map to Components 1 and 2. The Fourth National Communication (2021) is cited for Akkar's designation as a high-risk zone for climate-induced water stress. Sectoral coverage is appropriate: NWSS 2024-2035 (Pillar 1 on water security and the 2035 ministerial data management target), NWSS 2020 (Action 3.4 on decentralised wastewater treatment), MoA Strategic Directions 2025-2026, and the national technical standards (MoE Decision 8/1; LIBNOR 814-2024; Water Law 192/2020; EIA Decree 8633/2012, Section E, pp. 16-17). The alignment claims are internally consistent with the project description in Part II.A. CR 8: No national sustainable development strategy or SDG framework, poverty reduction strategy, or equivalent national development instrument is referenced like the National Economic Inclusion Strategy (2026) and the Long-Term Low Emission Development Strategy (LT-LEDS) (2025). Given that Akkar is described as one of

Lebanon's poorest governorates (p. 3), please indicate how the project aligns with any existing development strategies. CR 9: Alignment is presented exclusively at national level; no sub-national or local instrument is cited. Given the LLA framing, please include all the relevant governorate and municipal plans exist (for example the Wastewater Master Plan referred to on pp. 9–10, or municipal or union-level plans in the candidate areas) and how the project relates to them.

Does the project / programme meet the relevant national technical standards, where applicable, in compliance with the Environmental and Social Policy of the Fund? Does the project provide support to local actors and build their capacities to comply with the standards?

Response: Not Cleared

Secretariat: Yes, but clarification is needed. Section E (pp. 16–17) identifies four relevant instruments and states compliance logically. The approach of screening each pilot site once locations are confirmed, and annexing an ESMP to the full proposal, is appropriate given that sites are not yet selected. Gaps concern the coverage of standards for the physical works, the mandated institutions, and capacity support for compliance. CR 10: The standards identified relate to water and wastewater quality and environmental assessment. The project also involves civil works (constructed wetlands, piezometer drilling, station installation, RWH systems on greenhouses). Please indicate the applicable construction, drilling, well-licensing and occupational health and safety requirements, and how compliance will be assured; including whether abstraction or drilling authorisations are required under Water Law 192/2020 for the new piezometers and for metering of private wells. CAR 4: The institutions mandated to authorise, approve or certify the proposed interventions are not identified in Section E. Please specify the institutions responsible for the relevant permits and approvals, (including environmental screening and EIA/IEE approval, drilling and abstraction authorisation, effluent discharge authorisation, and clearance for agricultural reuse of treated wastewater and sludge); together with the current status of any required permissions, in line with ESP Principle 1. Note that MoA and public health authorities are not currently referenced in relation to the reuse pathway, and CDR's role in wastewater infrastructure is noted in the consultations (pp. 20–21) but not reflected here. CR 11: Component 3 (pp. 10–11) provides training on SCADA use, NbS O&M and water-efficient practices, but does not address the capacity of local actors to apply or comply with the national standards themselves: for example effluent monitoring and verification against Decision 8/1 and LIBNOR 814-2024, or the permitting and enforcement functions of NLWE and municipalities. Please indicate how local actors will be supported to meet these requirements, particularly given the intention that municipalities assume full O&M of the NbS.

Is there duplication of project / programme with other funding sources? Does the project enhance collaboration across sectors and enhance efficiencies and good practice?

Response: Not Cleared

Secretariat: Yes, however clarification is needed. Section F identifies four initiatives and states complementarity logically for most: the UNICEF GCF project on water security, the Netherlands-funded IHIS/EWS project, the Solidarités International-led Rofaqa'a Al Nahr flood risk project in the Al Ostouane basin, and the AF-funded Resilient Water Solutions against Climate Change (RWS-CC) project in Lebanon and Jordan. Cross-sectoral engagement spans water, agriculture, health and municipal governance. However, the mapping is incomplete and the treatment of overlap is asserted rather than demonstrated. CR 12: Section F does not present the full set of potentially overlapping initiatives. Please consolidate the mapping to include those referenced elsewhere in the note: AFD's Water Resources Programme, the GIZ plan, the LRA monitoring network, the citizen weather station network, the AICS/CDR wastewater station, and COOPI's solid waste work; as well as initiatives not

currently referenced: 1. The AF project "Enhancing Water Sector Resilience Through Nature-based Adaptation Technologies in North-Lebanon", covering nature-based adaptation technologies and enhanced monitoring of water resources; 2. The GCF/UNDP NAP readiness project "Increased climate resilience planning for municipal water resources in Lebanon", addressing the lack of reliable water resources data for municipal use; and 3. The AF-funded AgriCAL project implemented by IFAD, which includes water harvesting and irrigation technologies and early warning systems. For each, please state the areas of overlap and complementarity. CR 13: Complementarity with the GCF and Netherlands-funded projects is asserted on the basis that UNICEF holds a role in each, described on p. 18 as an arrangement that will "effectively eliminate the risk of duplication". Please describe the substantive division of scope between these initiatives and the AF project (which monitoring assets, geographies and functions each will finance), and set out the coordination arrangement through which overlap will be managed during implementation, including data-sharing arrangements with AFD, GIZ, LRA and CDR. CR 14: Section F identifies the Zahle RWH model under RWS-CC as a design basis for Component 2 but does not draw lessons from it or from other completed initiatives. Please summarise the lessons learned, and how these have informed the present design.

Does the project / programme have a learning and knowledge management component to capture and feedback lessons, in particular managing traditional and/or indigenous knowledge, where relevant? Does it contribute to building and institutionalizing local capabilities?

Response: Not Cleared

Secretariat: Yes but clarification is required. Section G lays out four KM elements: a replication toolkit for water monitoring networks, to be validated by MoE and MoEW for national adoption; an NbS replication plan for 10+ villages; academic partnerships with LARI, AUB and/or Balamand for peer-reviewed case studies on hydrogeological modelling and NbS performance, with regional workshops; and systematic documentation of the LLA process to inform future AF programming. These are budgeted within Components 1 and 2 rather than as a standalone component, which is acceptable. Institutionalisation of local capability is reasonably well addressed through Component 3, with the intended endpoint being local actors as custodians of the interventions (p. 11). CR 15: KM outputs are described as end-of-project products (the toolkit and replication plan are both scheduled for the final year, p. 7), and Section G does not describe how captured lessons will feed back into project delivery. Please indicate how experience will be tracked and reviewed periodically during implementation, and how findings will inform adjustments to the interventions (including the decision points already anticipated in the design, such as pilot site and technology selection, treated wastewater and sludge reuse pathways, and the transfer of O&M to municipalities). CR 16: Traditional and local knowledge is present in the consultation record but not carried into the KM approach. The note records a proposal to promote traditional rainwater cisterns as a culturally grounded NbS (p. 19), a socio-heritage analysis of the deteriorated community-river relationship (p. 20), a citizen weather station network with publicly accessible data (p. 20), and a municipal GIS inventory of wells, springs and ponds (pp. 20–21). Please indicate how local and traditional knowledge will be captured and used in project design and knowledge products. The observation on p. 20 that LARI meteorological data is not publicly accessible is also relevant here, given the concept note's reference to an open data platform, and the arrangements for data accessibility should be clarified.

Has a consultative process taken place, and has it involved and encouraged all key stakeholders, and vulnerable groups, to meaningfully participate in and lead adaptation decisions? Did the consultative process consider and address gender-based, economic and other inequalities in compliance with the Environmental and Social Policy and Gender Policy of the Fund?

Secretariat: Section H (pp. 18–22) documents eleven consultations between January and May 2026, well recorded with dates, attendees and substantive outcomes. The technical and institutional coverage is strong: NLWE, LARI, AFD, academic institutions, former municipal and union officials, civil society and environmental actors, and a multi-stakeholder validation workshop in May 2026. The outcomes are clearly reflected in the design, the recommendation to focus on a single watershed, the addition of snow monitoring at high-elevation recharge zones, saline intrusion monitoring along riverbeds, and engagement of local NGOs and youth structures alongside municipalities. The gap is that no vulnerable group or community-level actor was consulted. CAR 5: Section H records that vulnerable groups were not engaged at this stage due to security constraints, and no consultations with municipalities in candidate pilot areas or community members are documented. The PFG form sets out a formulation timeline and budgeted FGDs, but does not identify which vulnerable groups will be engaged. Please confirm that the planned consultations will include women, displaced populations, smallholder farmers and persons with disabilities, and indicate the arrangements and expertise provided for the gender assessment referred to in Section B, which is not currently reflected in the PFG budget. Please also indicate how FGD outcomes will inform catchment and site selection, given that these are to be determined through MCDA and expert assessment under PFG 2 with community engagement positioned as validation. Finally, please correct the consultation period stated in the Section H narrative (January to March 2026, while the table includes an entry for 20 May 2026) and align the narrative's reference to consultations taking place in the implementation phase with the formulation timeline set out in the PFG. Please also see CAR 2, CAR 3, and CR 5. CR 17: The consultative process is not described in gender terms; no women stakeholders are recorded among the eleven consultations, and no gender-differentiated inequalities emerged from or were addressed by the process. Please indicate how gender considerations will be integrated into the consultation methodology during formulation, including arrangements for separate sessions where needed. CR 18: Several substantive findings from the consultation record are not carried into the project design, and the concept note does not indicate whether they were considered and set aside or simply not yet addressed. Please indicate how the following have been or will be taken into account: 1. Conflicting and unenforced legal instruments over a critical recharge area. Consultation 10 (pp. 20–21) records that the Al-Kamouaa basin is the primary recharge source for the Al-Jumi aquifer, which supplies drinking water to approximately half of Akkar, that groundwater levels there have fallen from 10–15 m to 70 m, and that two contradicting government decrees (a 1991 MoE preservation decree and a 1993 MoT tourism decree) are both unenforced. Dr. Khazaal advised that the resulting governance gap be explicitly addressed in project design. This is directly material to Component 1, whose stated purpose is to define sustainable extraction limits and support enforcement of groundwater regulations by NLWE and municipalities. Please indicate whether the project intends to engage with this governance gap and, if not, how the enforcement pathway assumed in Component 1 is expected to function. 2. Institutional data-hoarding and the status of the open data platform. Consultation 7 (p. 20) records that LARI meteorological data is not publicly accessible, with the observation that the project's open data platform should remedy this. LARI is a named executing entity in the PFG form and a partner for meteorological station rehabilitation. The concept note refers to data being made accessible to local authorities but does not describe an open data platform, nor the data-sharing arrangements between LARI, NLWE, municipalities and communities. Please clarify the intended data governance and accessibility arrangements. Please also see CR 6 and CR 13. 3. Existing local data and monitoring assets. The Jurd Qaytaa Union of Municipalities holds a GIS-mapped inventory of wells, springs and water ponds on ArcGIS (pp. 20–21), and a citizen weather station network of five stations targeting around twenty across Akkar has published data since September 2025 (p. 20). Please indicate whether these are to be integrated into the monitoring network and the replication toolkit, given the emphasis in the May 2026 workshop on building on what exists rather than creating parallel structures (pp. 21–22). 4. Point-source contamination not addressed by the proposed interventions. Consultations record a solid waste dump above Fnaydeq Spring contaminating it directly, untreated wastewater from tourist facilities in Qamouaa polluting the aquifer (p. 20), a stalled Al-Abdi wastewater treatment plant, catastrophic pesticide and nitrate contamination in groundwater with farmers

irrigating directly with untreated wastewater (p. 20), and a partially dismantled Beno wastewater treatment station (p. 21). Please indicate how these findings inform the prioritisation of pilot sites and the scope of Component 2, and whether contamination sources outside the project's scope affect the achievability of the stated water quality outcomes.

Is the requested financing justified on the basis of full cost of adaptation reasoning?

Response: Not Cleared

Secretariat: Yes, but clarification is required. Section I (pp. 23–25) is structured around eight arguments that establish relevance. The activities respond to identified climate drivers in Akkar and the components are logically connected to those drivers. The case for NbS over conventional infrastructure, and for data as a precondition for aligning extraction with recharge, is coherently made. There is no formal co-financing. The weaknesses are that the section reads largely as a value-for-money and catalytic-finance argument rather than a full cost of adaptation justification, and that dependency on other initiatives is present in substance even without co-financing. CR 19: Section I does not distinguish the adaptation increment from the underlying development baseline. Several activities: rehabilitating stream gauges and meteorological stations, installing well meters, connecting assets to an existing SCADA system, wastewater treatment where none exists, drip irrigation training, and non-revenue water and service delivery improvements; could be read as addressing a longstanding infrastructure and service deficit driven by underinvestment and the financial crisis rather than by climate change. Please articulate, for each component, what the situation would be in the absence of climate change and what the requested financing adds beyond that baseline. CR 20: The note states that the Netherlands-funded project will directly support Component 1 with IHIS and early warning system development, that the GCF project overlaps with Components 1 and 2, that the AFD SCADA system is a precondition for Component 1's real-time function, and that sludge management will be handled through a National Sludge Strategy to be developed under the GCF project (pp. 9, 18). Please confirm that the project can deliver its outcomes and outputs if these parallel initiatives are delayed, reduced in scope or do not proceed, and indicate any contingency arrangements. CR 21: Section I attributes part of the justification to the project's role in unlocking future climate finance and enabling national-scale replication through the GCF pipeline (pp. 23–25). Please clarify how the requested amount is justified by the adaptation benefits delivered to vulnerable communities in Akkar within the project period, independently of its catalytic value for subsequent investments.

Is the project / program aligned with AF's results framework?

Response: Not Cleared

Secretariat: CAR 6: The alignment table does not use the AF results framework instructions. Please revise Part III.A using the current SRF and the SRF Alignment Table template (Table 2), correcting the following: 1. The objective-level row lists three Fund outcomes and three Fund outcome indicators against a single project objective indicator, with the full US\$5,000,000 attached; the template asks that the budget be separated by AF output and outcome indicator. The template further requires outcome- and output-level rows with grant amounts that sum correctly to the program/project activities. 2. Fund outputs are cited inconsistently. "Output 5" and "Output 6" are cited where the SRF designations are Output 5.1 and Output 6.1. 3. The Fund outcome indicators listed do not match the revised SRF wording. 4. Core indicators are not identified. Please see the SRF template <https://www.adaptation-fund.org/document/strategic-results-framework-guidance-2026/> <https://www.adaptation-fund.org/document/alignment-with-adaptation-fund-results-framework-template-and-guidance-dec-2025/>

Has the sustainability of the project/programme outcomes been taken into account when designing the project? Does the project/programme support long-term development of local governance processes, and improve the capacity of local institutions to ensure that communities can effectively implement adaptation actions over the long term?

Response: Not Cleared

Secretariat: Section J (pp. 26–28) is organised around four dimensions: financial, environmental, social and local ownership, and institutional and policy; and covers the main areas expected. The choice of low-tech, low-O&M NbS is a genuine sustainability argument in Lebanon's context, as is the reuse of existing infrastructure. Institutional anchoring in the NDC 3.0, NAP 2025 and NWSS is well evidenced, and the replication toolkit and NbS replication plan provide a plausible basis for scale-up. On local governance, the design includes the proposed NLWE delegation of authority to municipalities under a public-public partnership, community monitoring committees, water stewards, and grant-readiness training intended to allow municipalities and community committees to access climate finance directly. The weakness is that the financial and institutional sustainability arguments rest on assumptions the concept note elsewhere contradicts. CR 22: The sustainability case rests on NLWE and municipalities assuming O&M and recurrent costs, while the note records that Lebanon's financial crisis has left Water Establishments unable to maintain infrastructure or sustain data collection (p. 3), that municipal capacity to manage NbS O&M is limited (p. 19), and that NLWE has limited concessions in Akkar (p. 19). Please indicate how recurrent costs will be met after project closure (including the expected annual cost of NbS O&M and of sustaining the monitoring network and sampling campaigns) and the intended source of funds. Please also clarify how the exit arrangement will operate given NLWE's limited concessions in Akkar. CR 23: Sustainability of the monitoring network depends on continued data collection, calibration and equipment replacement beyond the project period, and on the SCADA system remaining operational. The note describes training but not the arrangements for sustaining data collection itself, nor the institutional home for the hydrogeological model and the data it generates. Please clarify these arrangements. Also see CR 18 on data governance and accessibility. CR 24: Section J does not address governance sustainability, in particular, the enabling conditions that would allow local institutions to act on the data. The note identifies weak enforcement of groundwater regulations, 40% of wells in Akkar operating illegally (p. 3), fragmented mandates between MoEW and water establishments (pp. 21–22), and unenforced conflicting decrees over a critical recharge area (pp. 20–21). Please indicate what governance arrangements the project expects to leave in place, and how the enforcement pathway assumed in Component 1 would be sustained. See CR 18.

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?

Response: Not Cleared

Secretariat: Section K (pp. 28–31) presents a completed checklist structured against the fifteen ESP principles, which is the correct organising basis. However the table is not filled in accordance to the AFs ESP template guidance. CAR 7: No environmental and social risk category is stated. Please state the category (A, B or C) determined through the screening process, with the rationale supporting that determination, applying the criteria in paragraph 8 of the AF ESP rather than the IE's own categorisation system. CAR 8: The checklist in Section K (pp. 28–31) is not completed in the required format. 1. In the column headed "No further assessment required for compliance", a check mark should be entered where this applies and the cell otherwise left blank; at present, narrative text has been entered in this column for four principles. 2. In the column headed "Potential impacts and risks - further assessment and management required for compliance", each identified risk should be characterised as low, medium or high, followed by a brief substantiation of the risk and an indication of how it

will be mitigated. Please resubmit the checklist in the correct format for all fifteen principles. CR25: The ESP requires the screening process to consider all potential direct, indirect, transboundary and cumulative impacts. The screening in Sections E and K addresses direct, largely construction-phase impacts and does not extend to the other three categories. Please indicate how the following have been considered, and reflect the findings in the checklist: 1. Cumulative impacts on aquifers. The project intends to define and support enforcement of sustainable extraction limits while abstraction pressure from other sources continues. Please indicate how cumulative abstraction across the coastal and Al-Jumi aquifers, including from wells outside the project's influence, has been considered in assessing whether the project's outcomes on aquifer recovery and seawater intrusion are achievable and whether any adverse cumulative effects arise. 2. Transboundary considerations. Akkar's northern boundary lies on the Nahr El Kabir, a basin shared with Syria, and the note identifies the South Kabeer among Akkar's four rivers (p. 20). Please indicate whether the project area or its hydrological influence extends to shared surface water or groundwater bodies, and whether any transboundary implications arise from monitoring, extraction limits or effluent discharge. 3. Indirect and downstream effects of the interventions. Discharge of treated effluent, agricultural reuse of treated wastewater, sludge generation and disposal, and any managed aquifer recharge each carry downstream water quality and soil implications that extend beyond the pilot sites. Please indicate how these have been assessed, including where sludge will go pending the National Sludge Strategy to be developed under a separate GCF project (p. 9). 4. Indirect social and economic effects of regulating extraction. The intended enforcement of extraction limits would affect farmers currently dependent on unlicensed wells, and metering of private wells is proposed under Component 1 (p. 7). The note records that farmers over-pump groundwater in response to drought and irrigate directly with untreated wastewater (pp. 2, 20). Please indicate how impacts on the livelihoods of these users, who are themselves among the vulnerable groups the project targets, have been considered, together with any risk of tension between host and displaced communities over reallocated water. See also CAR 2 and CAR 3. 5. Induced effects around project sites. Constructed wetlands, rainwater harvesting and improved water availability may induce land-use change, settlement or increased agricultural intensity in their vicinity. Please indicate whether such induced effects have been considered.

Resource Availability

Is the requested project / programme funding within the size for LLA single country grants?

Response: Not Cleared

Secretariat: Yes. Please clear the following on the PFG: CAR 7 : PFG 2 does not reconcile. Please revise the table so that all activity lines are captured in the subtotals and the fee base, present all figures in both tranches as whole numbers with no decimal places, and correct the presentation of PFG 2 Component 2: the unnumbered Environmental expert line, the absent budget note against it, the incomplete activity title at line 2.1, and the Output text at line 2.1 reproduced verbatim from PFG 1 line 2.2, which leaves the deliverable for the largest community-facing allocation undescribed. CAR 8: Two required elements are absent from the submission. 1. First, the section of the form reserved for activities that directly enable devolution of decision-making to the lowest appropriate level has not been completed, and the composition of PFG 2 is weighted towards technical assessment, with roughly 17% of the tranche community-facing; please complete this section and set out how the additional LLA funding will enable local actors to determine how adaptation actions are defined, prioritised and designed. 2. Second, the concept note commits to a gender assessment during the PFG (pp. 13–14), but no line item for it appears in either tranche; please include it in the budget or indicate how and from what source it will be financed. CR 22: Under the LLA window the PFG comprises a base grant of up to US\$150,000 and an

additional grant of up to US\$100,000, whereas the request is structured as two applications of US\$100,000 each; please confirm whether PFG 1 is intended as the base grant and PFG 2 as the additional grant, and whether both are submitted concurrently. Please also clarify the intended sequencing, as PFG 1 finances an NbS expert to assess villages and select installation sites while PFG 2 refines the geographical focus to one or two priority catchments through MCDA and hydrogeological modelling, so site selection appears to precede catchment prioritisation. Section A records the period in narrative rather than as dates; please give start and completion dates and confirm the period accommodates both tranches, given that the proposal-drafting consultant sits in PFG 1 while the analysis informing site selection sits in PFG 2. CR 23: PFG 1 line 1.1 allocates US\$70,000 to a single individual consultant, 70 per cent of the tranche and 35 per cent of the total request; please indicate the basis of this figure, including duration, daily rate and deliverables. Please also clarify whether the US\$8,000 (PFG 1, line 2.3) and US\$5,000 (PFG 2, line 1.4) for Executing Entity Climate Adaptation staff represent incremental costs, how they are distinguished from entity costs to be charged to the project at implementation, and how they relate to the 8.5 per cent IE fee. CR 24: The FGDs are described only as "a series" at governorate and sub-municipal level, with a further round funded under PFG 2. Please indicate the number of discussions, their locations and the participant groups to be reached, in particular women, displaced populations and farmers. See CAR 5. CR 25: The rationale states that PFG 2 will "establish a scientifically robust hydrometeorological monitoring framework, including stream gauges, weather stations, and multi-depth piezometers," and refers to a costing exercise "detailed under the IHIS-stations breakdown," which is not annexed. Please confirm that no equipment procurement, drilling or physical works are financed under the PFG, and provide the referenced breakdown.

Is the Implementing Entity Management Fee at or below 8.5% per cent of the total project/programme budget before the fee?

Response: Cleared

Secretariat: Yes, the IE fee is at or below 8.5%.

Are the Project/Programme Execution Costs at or below 9.5% per cent of the total project/programme budget (including the fee)?

Response: Not Cleared

Secretariat: CAR 9: The executing arrangements are stated inconsistently across the submission. Part I of the concept note identifies UNICEF as the sole Executing Entity; the PFG Submission Form identifies UNICEF, LARI and NLWE; and the Letter of Endorsement identifies UNICEF, NLWE, LARI, municipalities, local NGOs, academic institutions and a private technical consultancy firm. Please confirm in Part I the full set of entities that will hold execution responsibility, aligning it with the endorsed arrangement so that no revision to the Letter of Endorsement is required, and ensure the PFG Submission Form is consistent with it. Please also clarify the basis on which the private technical consultancy firm is designated as an Executing Entity rather than procured by one. CR 26: Section C (p. 14) indicates that UN-Habitat, alongside UNICEF, will support procurement, contract management and supervision of fieldworks. Please clarify whether UN-Habitat, as Implementing Entity, will execute any part of the project. If so, please indicate the value of that part, confirm that the associated execution cost does not exceed 1.5 per cent of it, and provide the justification required for such an arrangement to be approved on an exceptional basis. Please also indicate, in narrative form, how the execution cost of US\$341,355 is distributed across the executing entities.

Eligibility of IE

Is the project/programme submitted through an eligible Implementing Entity that has been accredited by the Board?

Response: Cleared

Secretariat: Accreditation Expiration Date is October 30, 2027.

CONCEPT NOTE PROPOSAL FOR SINGLE COUNTRY

PART I: PROJECT/PROGRAMME INFORMATION

Title of Project/Programme: Nature-based Water Management & Data-Driven Strategy for Climate Resilience in Akkar, Lebanon

Country: Lebanon

Thematic Focal Area: Water Resource Management and Climate Resilience

Type of Implementing Entity: National Implementing Entity

Implementing Entity: UNHABITAT

Executing Entities: UNICEF

Amount of Financing Requested: 5,000,000.00 (in U.S Dollars Equivalent)

Project Formulation Grant Request (available to NIEs only): Yes ☒ No ☐

Amount of Requested financing for PFG: 200,000.00 (in U.S Dollars Equivalent)

Letter of Endorsement (LOE) signed: Yes ☒ No ☐

NOTE: LOEs should be signed by the Designated Authority (DA). The signatory DA must be on file with the Adaptation Fund. To find the DA currently on file check this page: <https://www.adaptation-fund.org/apply-funding/designated-authorities>

Stage of Submission:

- ☐ This concept has been submitted before
- ☒ This is the first submission ever of the concept proposal

In case of a resubmission, please indicate the last submission date:

Please note that concept note documents should not exceed 50 pages, including annexes.

Project/Programme Background and Context:

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

Lebanon is facing a severe and worsening water crisis, driven by climate change, unsustainable management practices, and socio-political instability. The country's water resources are under stress, with total available freshwater resources estimated at approximately 714 cubic meters per capita annually, well below the 1,000 m³ threshold for water scarcity, while Lebanon maintains a relatively high level of water stress that is likely to increase in the coming years due to climate change impacts (National Water Sector Strategy 2024–2035, Ministry of Energy and Water (MoEW)). Climate projections indicate 29% reduction in water availability by 2080 (Lebanon Climate Risk Analysis USAID Lebanon 2019), leaving less than 500m³/capita per year and putting Lebanon in the category of Extreme water scarcity. Mean annual temperatures have already risen by 1.6°C between 1950 and 2020 (Lebanon's NDC 3.0, 2025), amplifying risks across critical sectors.

1.1 The national water challenges include:

- **Groundwater Overexploitation:** 70% of Lebanon's water supply comes from groundwater, but extraction rates exceed recharge by 30–50% in critical basins (MoE, 2022). Illegal wells (estimated at 80,000 nationwide (IWMI – ground water governance in Lebanon the case of Central Beqaa a policy White paper) and weak enforcement have led to aquifer depletion and seawater intrusion, particularly in coastal areas. Groundwater reserves are estimated to have dropped by 30–35 meters over the past four decades, with 35–40% of total reserves depleted (Lebanon's NDC 3.0, 2025; Lebanon NAP, 2025).
- **Climate Pressures:** Changing rainfall patterns, including more intense and less frequent precipitation events (NDC 3.0, 2025), are increasing the frequency of flash floods (e.g., January 2024 and 2026 Akkar floods), a risk further exacerbated by deforestation and degraded watersheds. Prolonged droughts have reduced agricultural yields, pushing farmers to over-pump groundwater, worsening scarcity. By 2050, inland regions such as Bekaa and Hermel are projected to experience up to 60 days annually of extreme heat above 35°C (NDC 3.0, 2025). Reduced water availability is further compounding groundwater depletion, directly linking reduced rainfall and rising temperatures to the aquifer over-exploitation described above.
- **Non-Revenue Water (NRW):** 40 to 60% of piped water is lost due to leaks, illegal connections, and poor maintenance (NWSS 2024).
- **Wastewater treatment plants (WWTPs)** are severely underfunded and largely non-functional of 104 WWTPs nationally, only 41 are fully operational and 35 are entirely non-operational. Only 25–30% of Lebanon's annually generated wastewater (275–328 Mm³/year) reaches any form of treatment, with the remainder discharged untreated into rivers, coastal areas, and agricultural land (MoEW/CDR, 2020; BAU, 2023; IWMI, 2024).
- **Refugee Influx:** Lebanon hosts approximately 1.5 million Syrian refugees, increasing water demand by 20–30% in northern regions like Akkar (UNHCR, 2023). From March 2025, more than 23,500 additional refugees have sought refuge in Akkar (UNHCR flash update, April 2025).

1.2 Akkar's Water Crisis:

Akkar is Lebanon's northernmost governorate, characterized by a diverse topography that spans a narrow coastal plain and low-lying agricultural areas to the west, and a mountainous hinterland reaching over 2,000m in the Akkar highlands to the east, resulting in differentiated climate vulnerabilities across the caza (coastal seawater intrusion vs. mountain snowpack/water retention decline). Akkar governorate is one of the poorest and most water-stressed regions in the country, described in the NAP 2025 as priority area facing chronic water scarcity or declining agricultural productivity, with unique vulnerabilities that compound the national crisis:

- **Groundwater Depletion and Seawater Intrusion (SWI):** Akkar's coastal aquifer is critically overexploited, with 40% of wells operating illegally (NLWE, 2023). Saltwater intrusion has contaminated 30% of wells in coastal areas, rendering water unfit for drinking or irrigation (LARI, 2022). In Akkar, SWI is observed up to 7 km from the shore (Elias et al., 2025).
- **Total Collapse of Wastewater Management:** No functional WWTPs exist in Akkar; untreated sewage flows directly into rivers and agricultural lands, contaminating crops with E. coli and heavy metals (MoE, 2023). This has led farmers to rely on polluted water for irrigation, posing severe public health risks (e.g., cholera outbreak in 2022 originated in Akkar).
- **Ecosystem Degradation:** Deforestation (loss of approximately 11% of tree cover since 2000) and abandoned agricultural stone terraces have reduced natural water retention capacity, worsening flood risk and accelerating soil erosion (Global Forest Watch, 2024; FAO, 2022).
- **Institutional and Data Gaps:** No integrated monitoring of surface and groundwater exists, leaving policymakers without reliable data to regulate extraction or plan interventions (MoEW, 2020). This is compounded by the severe lack of funding and technical capacity stemming from Lebanon's ongoing financial crisis, which has left Water Establishments unable to maintain infrastructure or sustain data collection operations (GWP-Med, 2024; UNICEF, 2022).

1.3 Climate Change Rationale

Lebanon's NDC 3.0 (2025) identifies water resources as Adaptation Priority 3, emphasizing the need to structure and develop sustainable water services, including irrigation, to improve people's living conditions. Key actions under this priority include:

- setting up an Integrated Hydrological Information System (IHIS) at MoEW with real-time data collection;
- designing and implementing a comprehensive water quantity and quality monitoring framework;
- developing cost-effective wastewater treatment and reuse plants prioritizing nature-based solutions in rural areas;
- and explore and develop alternative sources for irrigation including ensuring the participation of women and vulnerable groups for fair water allocation (NDC 3.0, 2025, Key Actions 3, 4, 5, 7, 8).

NDC 3.0 Guiding Principle 4 explicitly states: 'Incorporate Nature-Based Solutions as a first line of defence from the adverse impacts of climate change' (NDC 3.0, 2025). This project directly operationalizes this principle through constructed wetlands and rainwater harvesting systems.

The National Adaptation Plan (NAP, 2025) further identifies Akkar as a priority area for

water resources adaptation, placing it among 'water-scarce zones' requiring targeted watershed-based planning, water harvesting, and resilient irrigation systems (NAP 2025, Table 22: Application of spatial Prioritization by sector). The NAP's top-ranked water intervention (Rank 1) is the development of cost-effective nationwide wastewater treatment and reuse plants prioritizing nature-based solutions, directly aligned with this project's Component 2 (NAP 2025, Table 10: Prioritized adaptation interventions – Water Resources Sector).

1.4 Why This Project is Critical for Akkar

This project is critical for Akkar not only because of the scale of its water crisis, but because it operationalizes Locally Led Adaptation by devolving decision-making to the lowest appropriate level (NLWE, municipalities), addressing structural inequalities faced by women, youth, and displaced populations, and investing in durable local institutional capacity rather than short-term donor-dependent fixes. The proposed project directly addresses Akkar's converging crises by: i) filling critical data gaps through a real-time water monitoring network (the first of its kind in Lebanon) to provide the mechanism for autonomous local decision making (SCADA system handed directly to the NMWE); ii) piloting scalable nature-based solutions (constructed wetlands & rainwater harvesting) to manage water, reduce pollution and ultimately reuse alternative water sources; and iii) empowering local communities and institutions to lead sustainable water management, aligning with Lebanon's NDC commitment to NbS and the AF's Locally Led Adaptation principles.

Project/Programme Objectives:

List the main objectives of the project/programme.

The overarching goal of this project is to enhance climate resilience and water security in Akkar, Lebanon, through a data-driven and nature-based approach that empowers local institutions and communities to lead adaptation efforts.

The project's three interconnected objectives are:

1. Objective 1: Establish a robust, real-time water monitoring network to generate evidence-based data for sustainable water management and develop hydrogeological models of Akkar's aquifers, enabling local institutions to make autonomous, informed decisions on water allocation and extraction regulation.
2. Objective 2: Pilot scalable Nature-based Solutions (NbS) for wastewater treatment (constructed wetlands) and rainwater harvesting, demonstrating cost-effective alternatives that comply with Lebanese standards (Decision 8/1 MoE 2000, LIBNOR 814-2024 for the potential reuse of treated water) and can be replicated across Lebanon.
3. Objective 3: Strengthen the technical, financial, and governance capacities of local institutions (NLWE, LARI, municipalities) and communities, including women, youth, and displaced populations, to ensure long-term ownership, operation, and sustainability of adaptation solutions without dependence on project-based donor funding.

By aligning with Lebanon's Nationally Determined Contribution (NDC 3.0, 2025), the

National Water Sector Strategy (NWSS 2024–2035), and the National Adaptation Plan (NAP, 2025), the project will directly contribute to national targets for water security, climate adaptation, and ecosystem restoration. Without intervention, Akkar's water scarcity will deepen, threatening food security, public health, and social stability in a region already strained by poverty and displacement. This project offers a scalable, locally led model for Lebanon's water crisis response.

The project also presents an opportunity to strengthen the linkages between aquifer management, housing, basic services and land use, bringing them in one framework, thereby enhancing the long-term resilience and sustainability of water resources management in Akkar.

Project/Programme Components and Financing:

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

Project/Programme Components	Expected Concrete Outputs	Expected Outcomes	Amount (US\$)
1. Akkar Water Monitoring Network	• Hydrogeological model of Akkar aquifers • SCADA system for real-time monitoring • 6 upgraded meteorological stations • Stream gauges, piezometers, well meters rehabilitated and installed • Sampling campaigns (min. 2x/year for 2–3 years) • Replication toolkit for other regions	Reliable hydrological and hydrogeological data for evidence-based local and national decision-making	\$ 2 197 800
2. Nature-based Solutions (NbS)	• Constructed wetlands for WW treatment in 1–2 pilot villages • Rainwater harvesting (RWH) systems on greenhouses • WW quality compliant with Decision 8/1 MoE 2000 and LIBNOR 814-2024 • Replication plan for 10+ villages • Investigation of WW	Improved water quality, reduced demand, and demonstrated NbS for scalable adoption	\$ 1 663 200

	reuse potential		
3. Community Mobilization & Capacity Building	• 50+ trained NLWE/municipal staff on SCADA and data use • 20 community water stewards trained • Gender-inclusive farming programs targeting 30% women • Water-efficient practice training (drip irrigation) • Community-led monitoring committees established	Empowered local institutions and communities with autonomous decision-making capacity for long-term adaptation	\$ 405 940
4. Total Programme activities cost			\$ 4 266 940
5. Project/Programme Execution cost			\$ 341 355
6. Total Project/Programme Cost			\$ 4 608 295
7. Project/Programme Cycle Management Fee charged by the Implementing Entity (if applicable)			\$ 391 705
Amount of Financing Requested			\$ 5 000 000

Projected Calendar:

Indicate the dates of the following milestones for the proposed project/programme
The project is estimated to be completed within 3 years (36 months) from the signature of the agreement

Milestones	Expected Dates
Start of Project/Programme Implementation	Quarter 1 2028
Mid-term Review (if planned)	Quarter 3 2029
Project/Programme Closing	Quarter 4 2031
Terminal Evaluation	Quarter 3 2032

PART II: PROJECT / PROGRAMME JUSTIFICATION

A. Describe the project/programme components, particularly focusing on the concrete adaptation activities of the project, and how these activities contribute

to climate resilience. For the case of a programme, show how the combination of individual projects will contribute to the overall increase in resilience.

The three components are designed as an integrated system: Component 1 generates the data needed to identify the quantity and quality of water resources to target Component 2's NbS interventions and monitor their impact, while Component 3 ensures the institutional and community capacity to sustain both the monitoring network and the NbS infrastructure beyond the project's lifetime. This section details how the project's three components contribute to climate resilience in Akkar through locally led, data-driven, and nature-based adaptation interventions. This section also demonstrates how the project will operationalize autonomous decision-making by local institutions and clarify the specific mechanisms for devolving decision-making authority and funding to local entities.

Component 1: Akkar Water Monitoring Network

Years 1 and 2 for the development of the network and Year 3 to collect and consolidate preliminary data outputs into hydrogeological conceptual model, extraction limit recommendations and replication toolkits.

US\$ 2,197,800

Objective: Create a hydrological and hydrogeological database to inform national strategy inputs and serve as a locally controlled asset for evidence-based water governance in Akkar.

Concrete Adaptation Activities:

- Conduct a comprehensive survey of aquifers in specific areas of Akkar to identify locations for monitoring points, including both public and private (including unlicensed and unregulated) wells, with the objective of estimating water withdrawals and identifying the aquifers being exploited (this activity is estimated to take place during the proposal development phase with the support of the Project Formulation Grant).
- Rehabilitate existing stream gauge and install new ones in specific locations, additional loggers will be installed in existing abandoned wells, and the project will ensure the drilling of new piezometers to the specific locations defined after the hydrogeological assessment. In addition, UNICEF will ensure complement the installation of meters on all public wells in addition to the one installed by AFD under the reform program as well as complement the plan of GIZ. A limited number of private wells will be also equipped with meters to estimate the volume taken by the different private wells in the region.
- This project will complement the existing SCADA (Supervisory Control and Data Acquisition) system recently installed by AFD by ensuring that all the features (e.g. Loggers, stream gauges...) will be connected to it to collect real-time data, providing NLWE and selected municipalities with a continuous flow of operational data for decision-making.
- Upgrade and rehabilitate existing meteorological stations (pluviometers, evapotranspiration sensors) in coordination with LARI and identify possible snow monitoring stations in the mountainous areas of Akkar.
- Conduct sampling campaigns (minimum 2 per year over 2–3 years) to inform

qualitative water data and assess the progression of seawater intrusion (SWI) in coastal areas.

- Develop a hydrogeological conceptual model of pilot area in Akkar Caza defining the main recharge mechanisms, aquifer flows, and inform/define sustainable extraction limits (Quantity withdrawn $\leq$ yearly recharge) this activity will be developed on the last year of the project in the selected watershed. Data -quality assurance arrangements will be applied to mitigate the risk of poor-quality monitoring data. UNICEF will be investigating the use of an opensource system (ie. HydroModPy or others) to ensure easy replication of the methodology.
- Produce a replication toolkit for deployment of similar monitoring networks in other cazas/governorates across Lebanon. The toolkit will be practical and user-friendly, tailored to end users and accompanied by training on its application. This activity will be developed in the last year of the project.

Climate Resilience Contribution: This component fills the critical data gap that currently prevents evidence-based water management in Akkar (NWSS 2020; NAP 2025). The real-time monitoring network will ultimately enable dynamic water allocation during droughts, enforce extraction limits aligned with aquifer recharge rates, and track the progression of SWI, directly supporting NDC 3.0 Water Priority Key Action 7 ('Set up an Integrated Hydrological Information System at MoEW') and Key Action 8 ('Design and implement a comprehensive water quantity and quality monitoring framework') (NDC 3.0, 2025).

Locally Led Adaptation Dimension: This Locally Led Adaptation (LLA) dimension responds directly to two core LLA principles. First, it invests in local capabilities to leave a lasting institutional legacy by strengthening the capacity of NLWE staff to operate and maintain the SCADA system, ensuring its long-term sustainability beyond the project's lifetime. In addition, the data generated by the monitoring network will be made directly accessible to local authorities, including the NLWE and municipalities, enabling them to make informed decisions on water allocation, enforce groundwater regulations, support agricultural planning, and prioritize Nature-based Solutions (NbS) interventions. This ensures that the monitoring network functions as a locally owned and managed asset for autonomous decision-making, rather than solely as a tool for national reporting. Second, the project builds a robust understanding of climate risk and uncertainty by providing local decision-makers with access to real-time monitoring data and a hydrogeological model, thereby strengthening evidence-based planning and adaptive water resources management.

Additionally, UNICEF will assess the feasibility of establishing youth-led groups of community water stewards to support the surveillance and routine cleaning of water monitoring infrastructure, particularly stream gauges. Trained under Component 3, these youth stewards will contribute to community-based monitoring and local ownership, working in coordination with municipalities and the North Lebanon Water Establishment (NLWE).

Component 2: Nature-based Solutions
Years 1 and 2 for the implementation
US\$ 1,663,200

Objective: Demonstrate NbS for improved local water management through pilot interventions in 1 or 2 selected villages/municipalities in Akkar.

Concrete Adaptation Activities:

- Construct NbS for wastewater treatment (constructed wetlands, reedbeds filters or any other proven nature-based solutions) in selected pilot village(s), including separation of storm/rainwater from household and industrial wastewater. Design will prioritize low-tech, low-O&M solutions suitable for local management in coordination and codesigned with the selected municipality.
- Investigate potential reuse of treated wastewater based on LIBNOR standards (LIBNOR 814-2024) and agricultural activities in the selected area, and the effluent if discharged directly in the nature will comply with MoE Decision 8/1 (2000).
- Investigate potential reuse of sludge in line with the National Sludge Strategy UNICEF is planning to launch as part of a Green Climate Fund project directly linked to this project.
- Promote and install rainwater harvesting (RWH) systems on greenhouses, building on the successful UNICEF model implemented in Zahle district under the Water Resilient Solutions against Climate Change regional project implemented in Lebanon through AF funding. Recognizing the risk of farmer reluctance to adopt RWH, targeted awareness-raising and stakeholder engagement will be conducted to support uptake.
- Develop a replication plan for promotion and average cost estimated of constructed wetlands and RWH in 10+ additional villages as part of Lebanon's wastewater strategy.

Climate Resilience Contribution: NbS address both water quality and quantity challenges simultaneously.

- 1- Constructed wetlands can reduce wastewater pollution by up to 80% (compliant with LIBNOR 814-2024 and Decision 8/1 MoE 2000), mitigating public health risks that were dramatically illustrated by the 2022 cholera outbreak in Akkar (MoE, 2022).
- 2- RWH reduces dependence on overexploited groundwater, diversifying water sources.

In addition, constructed wetlands and rainwater harvesting also enhance water availability during dry periods by enabling safe reuse of treated water for irrigation, and can attenuate peak flows during flash floods by temporarily storing runoff, contributing directly to both drought and flood resilience.

These interventions align directly with NAP 2025 Rank 1 water intervention (cost-effective wastewater treatment and reuse prioritizing NbS in rural areas) and NDC 3.0 Water Priority Key Action 4 (Develop cost-effective wastewater treatment and reuse plants prioritizing nature-based gender sensitive solutions in rural areas) (NDC 3.0, 2025; NAP 2025, Table 10).

Locally Led Adaptation Dimension:

During the Proposal development phase, several consultations will be conducted, and municipalities will be screened to assess the feasibility of implementing Nature-Based Solutions (NbS). The pre-selection of municipalities was based on the following criteria:

- Alignment with the Wastewater Master Plan, identifying locations where NbS are

- more cost-effective than connection to centralized wastewater treatment plants;
- Demonstrated commitment and engagement of the municipality;
- Level of climate vulnerability (e.g. exposure to seawater intrusion, drought frequency)
- Level of environmental degradation, particularly pollution resulting from untreated wastewater.

The final selection of the village will be done at Proposal development phase followed by the initial design and cost estimate of the NbS. The NbS will be co-designed with local communities, including women, youth, people with special needs, and displaced populations through Focus Group Discussions (FGDs) and co-design workshops to select the technology and identify the suitable location. Youth climate advocates will be engaged in the co-design process, community consultations, and awareness-raising activities, strengthening local ownership and social accountability.

Municipalities will lead site selection, community mobilization, and O&M planning, working in coordination with community members and youth-led structures. A clear pathway will be established for municipalities to gradually take over the full operation and maintenance of NbS, representing a genuine decentralization of technical stewardship in line with LLA principles.

In addition, under the GCF project, UNICEF foresees supporting the development of a National Sludge Management Strategy. The management of sludge generated by the NbS will be incorporated into this strategy, and potential sludge reuse opportunities will be assessed and identified.

Component 3: Community Mobilization and Capacity Building

Years 2–3

US\$ 405,940

Objective: Strengthen the capacity of local institutions, communities, and farmers to autonomously manage adaptation interventions and sustain outcomes beyond the project cycle.

Concrete Adaptation Activities:

- Support NLWE to use, interpret, and share data collected by the SCADA system for real-time water management and enforcement of extraction regulations.
- Train NLWE and/or municipality staff (50+ people) for the operation and maintenance of NbS infrastructure (constructed wetlands, RWH systems).
Build capacities of youth in Akkar on climate change, water resources, and nature-based solutions, aligned with NDC 3.0 and NAP 2025.
- Train farmers in water-efficient practices (drip irrigation, crop selection aligned with water availability data) with targeted gender inclusion—specifically targeting women-led farming cooperatives (minimum 30% of trainees), building on UN-Habitat's experience with urban farming in Tripoli (2024), UNICEF trainings of farmers on drip irrigation and water efficient practices in Zahle District (RWS-CC funded by AF (ended in 2026)) and UN Women's gender-responsive programming (2022–2023).
- Establish community water stewards (20 trained individuals) to serve as local champions for sustainable water management and behavioral change.
- Establish community-led monitoring committees with delegated authority to oversee water systems, report anomalies, and interface with NLWE on enforcement.
- Build capacities of youth in Akkar on climate change, water resources, and

nature-based solutions, aligned with NDC 3.0 and NAP 2025.

- Engage youth as climate advocates to lead community awareness on water conservation, pollution reduction, wastewater reuse, and rainwater harvesting
- Support youth participation in community monitoring committees and dialogue with municipalities and water institutions.
- Promote inclusive water governance, with a focus on young women and youth from marginalized and vulnerable or displaced communities.
- Strengthen local ownership and long-term sustainability of water adaptation solutions through youth-led engagement.
- Develop and deliver climate literacy programs for community members, emphasizing the links between climate change, water scarcity, and livelihood security.
- Strengthen the technical, financial, and governance capacities of local institutions (NLWE, LARI, municipalities).

Climate Resilience Contribution: Capacity building ensures that climate data and NbS infrastructure translate into sustained behavioral and institutional change. Trained local actors become the custodians of adaptation interventions, reducing dependency on external support and ensuring long-term resilience.

This component of the project will sensitize and support farmers in ensuring groundwater extraction is reduced. The project aimed at 15% reduction in groundwater extraction in the targeted area represents a measurable contribution to aquifer recovery. This aligns with NAP 2025 guiding principle to: Empower local authorities and communities in adaptation planning and implementation (NAP 2025, Table 3).

This component operationalizes the Locally Led Adaptation (LLA) principles by investing in local capacities through staff and community training, thereby leaving a lasting institutional legacy, and by fostering collaborative action through community-led monitoring committees. During the development of the Full Funding Proposal, supported by the Project Preparation Facility (PPF), UNICEF and its partners will further define the specific mechanisms for devolving decision-making authority and financial resources to these local entities. The PPF will also support the assessment and strengthening of the technical, financial, and governance capacities required to ensure that these local institutions are fully equipped to lead and sustain climate adaptation efforts over the long term.

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

The project is designed to generate tangible economic, social, and environmental benefits for vulnerable communities in Akkar, while strengthening local adaptive capacity to climate-induced water stress. The approach emphasizes participatory governance, inclusive decision-making, and community ownership, ensuring that vulnerable groups are not only beneficiaries but active actors in climate adaptation.

Community engagement mechanisms are designed to ensure that marginalized and

vulnerable populations, including smallholder farmers, youth, women, persons with disabilities, and displaced populations, participate meaningfully in decision-making processes related to water management and nature-based solutions (NbS).

Participatory Planning Framework

During the project formulation phase, Focus Group Discussions (FGDs) and participatory design workshops will be conducted in each target community. These consultations will:

- Identify community priorities related to water security and climate risks
- Validate appropriate NbS typologies (e.g., constructed wetlands, rainwater harvesting systems)
- Define community roles in implementation and operation and maintenance (O&M)

Targeted sessions will be organized for women, youth, and marginalized groups to ensure their perspectives are reflected in project design and governance arrangements.

Community-Based Monitoring and Governance

To ensure sustainability and accountability, the project will establish Community Monitoring Committees responsible for overseeing the functionality, maintenance, and local oversight of NbS infrastructure and water monitoring systems. These committees will be trained and supported under Component 3 (Capacity Building and Data Governance). Youth will play an active role in community-based monitoring, awareness-raising, and local dialogue on sustainable water management, strengthening transparency and social accountability

The committees will work in coordination with the North Lebanon Water Establishment (NLWE) to strengthen institutional linkages between community-based water management and formal service providers.

Multi-dimensional Benefits

The project delivers interlinked economic, social, and environmental benefits that directly support climate resilience in Akkar while prioritizing marginalized and vulnerable populations. These outcomes are aligned with the Adaptation Fund Environmental and Social Policy (ESP) and Gender Policy (GP).

Benefit Type	Expected Benefits
Economic	• Potential and Estimated US\$200,000/year in avoided groundwater pumping costs due to reduced reliance on energy-intensive groundwater extraction (project-level estimate) • Reduced healthcare expenditures associated with waterborne diseases • Increased agricultural productivity through improved water availability and quality for irrigation • Local job creation through NbS construction, maintenance, and environmental monitoring activities

Social	• More than 300,000 indirect beneficiaries benefiting from improved water access and quality; • Inclusive consultations ensuring participation of both host communities and displaced populations • Strengthened social cohesion through participatory water governance structures • Gender-responsive programming with targeted engagement of women-led agricultural cooperatives • Reduced exposure to contaminated water sources and associated public health risks
Environmental	• Treatment of approximately 100,000 m³/year of wastewater through nature-based treatment systems such as constructed wetlands • Reduced groundwater abstraction contributing to mitigation of seawater intrusion (SWI) in coastal aquifers • Preservation of ecosystem services through NbS interventions including wetlands and rainwater harvesting systems • Reduced untreated wastewater discharge to rivers and agricultural lands • Carbon sequestration co-benefits associated with wetland ecosystems

Gender Considerations and Vulnerable Groups

The project integrates gender-responsive adaptation measures in line with the Adaptation Fund Gender Policy and Lebanon's national gender analysis frameworks. National gender assessments highlight that women often play a central role in household water management, food preparation, hygiene practices, and agricultural labor, yet frequently face structural barriers to land ownership, decision-making authority, and access to formal agricultural support services (National Commission for Lebanese Women (NCLW) & UNDP, 2021). These challenges are particularly pronounced in rural areas such as Akkar.

Recognizing these disparities, the project adopts a gender-responsive approach aimed at strengthening women's participation in climate-resilient water governance.

Key measures include:

- Conducting a dedicated gender assessment during the PFG-funded project formulation phase, in accordance with Adaptation Fund Gender Policy requirements. This assessment will be led by EE Gender and SEA experts;
- Ensuring a minimum of 30% participation of women in all training and capacity building activities;
- Prioritizing women-led agricultural cooperatives as beneficiaries of climate-resilient water management interventions;

- Integrating gender audits within community water governance structures to ensure equitable representation;
- Collecting and monitoring sex-disaggregated data across all project indicators;

Through these measures, the project aims not only to ensure equitable access to adaptation benefits but also to strengthen women's participation in local water governance systems.

C. Describe or provide an analysis of the cost-effectiveness of the proposed project/programme.

The project prioritizes cost-effective, high-impact solutions that maximize adaptation benefits per dollar invested:

NbS vs. Conventional WWTPs: Constructed wetlands require substantially lower capital investment than equivalent conventional mechanized wastewater treatment plants in rural contexts, with comparative studies showing CAPEX savings of 30–67% depending on scale and technology, while their annual operation and maintenance costs typically represent only 1–2% of total capital investment, making them financially sustainable for resource-constrained local institutions such as those in Akkar. The low-tech design reduces dependence on imported spare parts, external technicians, and continuous electricity supply being critical factors in Lebanon's current crisis context. Compared to conventional infrastructure, NbS also deliver co-benefits including biodiversity conservation, carbon sequestration in wetland vegetation and soils, and improved landscape aesthetics.

Infrastructure Reuse: The project will retrofit existing infrastructure (abandoned wells with loggers for groundwater monitoring, existing stream gauge and meteorological stations for upgrade) wherever possible, minimizing capital expenditure on new installations.

Delegation of Authority and Shared Governance:

The NLWE has expressed its openness to provide delegation of authority under a Public Public Partnership to provide the selected municipality with the power to operate and maintain the NbSs solutions installed in its area.

Where the selected municipality(ies) express readiness, UN-Habitat/ UNICEF will support them in leading procurement and implementation processes. This includes managing contracts and supervising fieldworks with oversight mechanisms jointly led by UNICEF and the municipality. Vulnerable community members will be prioritized for inclusion in the O&M workforce and decision-making spaces.

Replication and Scalability: The replication toolkit (Component 1) and NbS replication plan (Component 2) ensure that lessons and methodologies generated by this investment can be scaled to other governorates (e.g., North, Baalbek-Hermel, Bekaa, Mount Lebanon) facing similar water challenges, exponentially increasing the cost-effectiveness of the initial investment.

Strengthen the technical, financial, and governance capacities of local institutions (NLWE, LARI, municipalities): Component 3 will include a dedicated financial literacy and grant-readiness training module for municipalities and community committees, enabling them to access climate finance directly (e.g., AF, GCF small grants) without relying solely on intermediary agencies.

Long-term Savings: By establishing sustainable water management based on real-time data (e.g., enforcing extraction $\leq$ yearly recharge), the project averts future costs associated with aquifer collapse, larger SWI remediation, and mitigate health emergencies from contaminated water based in the area where NBSs will be installed.

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

The project operationalizes multiple key national policies, ensuring coherence with Lebanon's climate and development priorities:

National Strategy/Plan	Relevant Provisions	Project Alignment
NDC 3.0 (2025)	Adaptation Priority 3 (Water); Guiding Principle 4 (NbS as first line of defence); Key Actions 4, 7, 8 on water monitoring and NbS	Component 1 (monitoring) aligns with Key Actions 7-8; Component 2 (NbS) aligns with Key Action 4 and Guiding Principle 4
National Adaptation Plan (NAP, 2025)	Water ranked among top priority sectors; Akkar identified in spatial prioritization for water resources; Rank 1 intervention: wastewater treatment NbS	Directly implements NAP Rank 1 water intervention in an NAP-priority geographic area
NWSS 2024–2035	Pillar 1: Enhanced Water Security; data management and monitoring system operational at Ministry by 2035	Component 1 delivers the monitoring infrastructure; Component 3 ensures institutional capacity to sustain it
NWSS 2020	Action 3.4: Promote decentralized wastewater treatment	Component 2 pilots decentralized NbS-based WW treatment
MoE Fourth National Communication (UNFCCC, 2021)	Akkar designated as 'high-risk zone' for climate-induced water stress	Entire project targets Akkar as the intervention zone

LIBNOR 814-2024 and MoE Decision 8/1 (2000)	Standards for treated wastewater quality and reuse	Component 2 NbS designed for compliance with national standards and assessment to ease reuse will ensure its integration in design and site selection
MoA Strategic Directions 2025–2026	Sustainable farming, water-saving technologies, resilience	Component 3 farmer training in water-efficient practices

E. Describe how the project/programme meets relevant national technical standards, where applicable, such as standards for environmental assessment, building codes, etc., and complies with the Environmental and Social Policy of the Adaptation Fund.

The project complies with the following national technical standards and the AF Environmental and Social Policy:

MoE Decision 8/1 (2000): Environmental norms for wastewater discharge. Constructed wetland outputs will comply with Decision 8/1 requirements for effluent quality before discharge or reuse.

Water Law 192/2020: Lebanon's water governance framework. The project supports implementation of this law, particularly articles pertaining to water quality protection and the polluter-pays principle, by providing NLWE with the monitoring data necessary for enforcement.

LIBNOR 814-2024: National standard for treated wastewater quality and reuse. All NbS (Component 2) will be designed to ensure effluent quality meets LIBNOR 814-2024 thresholds for potential agricultural reuse.

Environmental Impact Assessment (EIA) Decree 8633/2012: Given the nature of project activities (monitoring infrastructure, small-scale NbS), a full EIA seems unlikely to be required. However, Environmental Screening will be conducted at project development stage based on PFG funds to ensure compliance with the Decree and define if an Initial Environmental Examination or an Environmental Impact Assessment will be needed.

The project has been screened against the fifteen principles of the Adaptation Fund's Environmental and Social Policy (ESP), as set out in the checklist under Section K. Four principles require no further assessment: no adverse human rights impacts are anticipated, as the project improves access to water and basic services; no Indigenous Peoples as defined under the AF policy are present in the project area; no land acquisition or displacement is involved, as nature-based solutions will be sited on publicly owned or voluntarily provided land; and the project enhances climate resilience with no negative climate impact. The remaining risks are minor, localized, temporary and reversible, relating mainly to small-scale construction works (occupational health and safety, temporary waste, soil disturbance, chance finds and localized habitat disturbance) and to ensuring equitable access for women, refugees and smallholder farmers. All are manageable through standard mitigation measures, and the nature-based solutions are expected to deliver net positive environmental outcomes over the longer term. As the pilot sites will be confirmed during formulation,

an environmental and social screening will be conducted for each site under the Project Formulation Grant to determine whether an Initial Environmental Examination or an Environmental Impact Assessment is required under Decree 8633/2012, and a full Environmental and Social Management Plan will be annexed to the full proposal. Consistent with the ESP and the AF Gender Policy, dedicated consultations with vulnerable groups, gender-disaggregated participatory assessments and an accessible grievance mechanism will be applied throughout.

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

The project is designed to complement, not duplicate, existing and planned interventions in Akkar and Lebanon. A mapping of related projects has been conducted:

Enhancing Water Security and Sustainable Water Resource Management in the Face of Climate Variability is a Green Climate Fund (GCF) proposed project currently being developed by UNICEF around a continuous **Monitor–Protect–Distribute–Reuse** feedback loop. While some proposed activities overlap with those under Components 1 and 2, the fact that UNICEF serves as both the Executing Entity (EE) for this project and the Accredited Entity (AE) for the GCF project ensures strong coordination, integrated planning, and harmonized implementation. This institutional arrangement will effectively eliminate the risk of duplication while maximizing synergies, complementarity, and the efficient use of resources.

Strengthening Data-Driven Water governance and Risk preparedness in Lebanon, funded by the Kingdom of the Netherlands will directly supporting Component 1 with IHIS And Early warning system development, this project is national and UNICEF is the direct recipient, ensuring as for the GCF proposed project, strong coordination, integrated planning, and harmonized implementation. This institutional arrangement will effectively eliminate the risk of duplication while maximizing synergies, complementarity, and the efficient use of resources.

Rofaqa'a Al Nahr, Integrated Flood Risk Management, Early Warning and Early Action Project implemented by Solidarités International (lead), Lebanese CNRS, Lebanese and French Red Cross targeting Al Ostouane (Akkar) and Ghzayel (Beqaa) River bassins.

This project focuses on flood protection infrastructure and development/reinforcement of early warning systems. The proposed AF project complements it by adding the upstream monitoring and NbS dimensions (water quality, groundwater management, wastewater treatment) that are absent in current efforts.

Water Resilient Solutions Against Climate Change in Lebanon and Jordan: Project funded by the Adaptation fund with UNHABTAT as Implementing Entity and UNICEF and UNESCWA as Executing Entity.

The RWH model piloted in Zahle provides a proven design basis for Component 2 RWH activities in Akkar, ensuring lesson transfer and replication.

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

The project incorporates a dedicated learning and knowledge management strategy designed to capture, document, and disseminate lessons from the LLA process:

Replication Toolkit (Component 1): A comprehensive guide documenting the methodology, data protocols, institutional arrangements, and costs for deploying water monitoring networks in other governorates (e.g., Baalbek-Hermel, Bekaa, North and South Lebanon facing SWI). This toolkit will be validated by MoE and MoEW for national adoption.

NbS Replication Plan (Component 2): A detailed plan for promoting constructed wetland technology in 10+ additional villages, including technical specifications, cost estimates, and community mobilization guidance, contributing to Lebanon's national wastewater strategy.

Academic Partnerships: LARI and academic institutions (American University of Beirut and/or Balamand University) will publish peer-reviewed case studies on the hydrogeological modeling results and NbS performance data. Regional workshops will be hosted to share findings with the broader Lebanese and possibly Mediterranean water community.

LLA Process Documentation: The project will systematically document the LLA process including the participatory planning framework, community-led monitoring model, and municipal capacity development pathway. This will enable generating evidence on effective approaches to locally led water adaptation that can inform future AF programming.

H. Describe the consultative process, including the list of stakeholders consulted, undertaken during project preparation, with particular reference to vulnerable groups, including gender considerations, in compliance with the Environmental and Social Policy and Gender Policy of the Adaptation Fund.

The project team composed of UNICEF and UNHABITAT conducted a series of targeted technical consultations between January and March 2026 with key national experts, academic institutions, UN agencies, water authorities, and civil society representatives active in the Akkar region. These consultations informed the design of all three project components and confirmed the relevance and local ownership of the proposed intervention.

Note on Vulnerable Groups and Gender Considerations: The ongoing security situation in Lebanon during the consultation period severely constrained the ability of the project team to conduct in-person field consultations in remote and conflict-affected areas of Akkar. As a result, it was not possible to directly engage vulnerable groups, including women, refugees, and farmers in the stakeholder consultation process at this preparatory stage. The project team acknowledges this gap and is fully committed to addressing it during the

implementation phase. Dedicated consultations with vulnerable groups, including gender-disaggregated participatory assessments, will be conducted in strict compliance with the Adaptation Fund's Environmental and Social Policy (ESP) and Gender Policy, ensuring that the voices and needs of the most marginalized populations, particularly women and female-headed households; are meaningfully integrated into the final project design, monitoring framework, and all implementation activities.

#	Date	Attendees	Main Outcomes & Recommendations
1	29-janv-26	Kevin Bonel (UNICEF), Ihab Jomaa (The Lebanese Agricultural Research Institute (LARI))	LARI expressed strong interest in supporting the project across all components. LARI can contribute through capacity building and technical expertise, particularly in the design and implementation of Nature-Based Solutions (NbS), including wetlands. Regarding meteorological monitoring, LARI operates in agrometeorology, tracking: soil moisture, air humidity, temperature, rainfall, atmospheric pressure, wind speed, and solar radiation — enabling estimation of evapotranspiration (ETP), critical for water resource management. LARI will: (i) assess the status of the six meteorological stations in Akkar and identify rehabilitation needs; (ii) provide a sample monitoring dataset. UNICEF has coordinated with the Litani River Authority (LRA) on the hydrological monitoring network (stream gauges) and data access facilitation.
2	04-févr-26	Kevin Bonel (UNICEF), Alain Maroon (AFD, BTD, Water Resources Programme - WRP)	WRP has to date: equipped key pumping fields in Ain Yacoub and Al-Oyoun; installed metering systems for major springs (e.g., Jeita, Bassaas); and advanced the establishment of a SCADA control room for the North Lebanon Water Establishment (NLWE), nearing completion. A bilateral coordination meeting is recommended to: clarify WRP achievements and ongoing activities; define complementarities; and avoid duplication with PPF-supported activities.
3	05-févr-26	Kevin Bonel (UNICEF), Joanna Doummer (American University of Beirut - AUB)	AUB has developed an initial model and dataset on Seawater Intrusion (SWI) in Akkar, requiring further refinement and updated field data. There is interest in assessing the feasibility of Managed Aquifer Recharge (MAR) in Sahel Akkar (risk of clogging, effectiveness in coastal aquifers). It is critical to: define the type of model required (conceptual vs. numerical; predictive vs. scenario-based); specify decision-support objectives (MAR site selection, abstraction limits, salinity risk); and identify data gaps. Strong collaboration potential with AUB, contingent on aligning outputs with MoEW and Water Establishment needs.
4	13-févr-26	Kevin Bonel (UNICEF), Gaby Nasr (North Lebanon Water Establishment - NLWE)	Gaby Nasr was enthusiastic about the project even if the project is focussing solely on Akkar where the Water Establishment has limited concessions, but confirmed the vulnerability of the area, and detailed the works done between the AFD and the Water Establishment on the monitoring of the production wells and the SCADA systems to which this project will be connected.
5	12-mars-26	Kevin Bonel (UNICEF), Mohamad El Dheiby & Elias Abinajem (UN-Habitat), Dr. Ata	Dr Elias, proposed to focus resources on one specific watershed (e.g., Ostwan River) rather than all of Akkar, to ensure a holistic, depth-focused, and replicable intervention. Strengthen monitoring for saline intrusion along riverbeds — intrusion progresses upstream via river channels, not only through direct groundwater pumping. Recommend adding snowfall monitoring at high-elevation recharge zones (Salat al-

		Elias (Hydrogeologist Lebanese University)	Kammoua / Jurd Akkar). Municipal capacity to manage NbS O&M is limited; recommend engaging local NGOs and civil society groups (scouts, youth, Red Cross) alongside municipalities. Promote traditional rainwater cisterns as a culturally grounded NbS for reuse and aquifer recharge.
6	13-mars-26	Kevin Bonel (UNICEF), Elias Abinajem & Mohamad El Dheiby (UN-Habitat), Saada Allaw (Legal Agenda, Head of Journalism & Human Rights Expert)	Saada conducted a 30-day fieldwork study documenting encroachments over Akkar's four rivers (Bared, Arka, Ostwan, South Kabeer), based on 20 expert interviews, field observations, photos/videos, and consultations with local authorities and Mukhtars. Key findings: all river channels and irrigation canals are heavily contaminated by wastewater and solid waste; wells used for irrigation in Sahel Akkar are also contaminated. Study includes socio-heritage analysis of the deteriorated community-river relationship. Publication postponed to May 2026 (due to ongoing hostilities); will coincide with a Beirut conference.
7	13-mars-26	Kevin Bonel (UNICEF), Mohamad El Dheiby & Elias Abinajem (UN-Habitat), Khaled Taleb (Environmental Activist, Akkar Trail / IFFT, Forestry & Ecology Expert)	Khaled leads a citizen weather station network (currently 5 stations, targeting ~20 across Akkar) collecting meteorological data (wind, rainfall, temperature) publicly accessible online since September 2025. Data supports agri-environmental forecasting and wildfire alerts for farmers. Satellite imagery (Sentinel/NDVI indices) is used as a complement where ground-station coverage is limited. Khaled participated in the Legal Agenda water study survey and confirmed availability to support project field activities. Raised concern that LARI meteorological data is not publicly accessible due to institutional data-hoarding — the project's open data platform should remedy this.
8	16-mars-26	Kevin Bonel (UNICEF), Mohamad El Dheiby (UN-Habitat), Prof. Jalal Halwani (Lebanese Canadian University, former LU Water & Environment Research Lab Founder, 30+ years on Akkar)	Identified three causes of salinity in Akkar: (i) over-extraction of irrigation wells; (ii) geothermal spring intrusion near Samakiya (sulfate-rich hot spring, discovered 1965); (iii) reduced river flow. Emphasized urgency of completing the Al-Abdi wastewater treatment plant (construction stalled) to reduce microbiological contamination in the coastal plain. Pesticide and nitrate contamination in groundwater are at catastrophic levels, farmers irrigate directly with untreated wastewater. Offered to share three PhD-level research papers on pesticide pollution and health impacts in Akkar. Proposed a field visit to Burj Al Arab (active PhD study site on water-food nexus) as a potential project demonstration site.
9	16-mars-26	Mohamad El Dheiby (UN-Habitat), Abdul Elah Zakaria (Former Head of Jurd Qaytaa Union of Municipalities, former Mayor of Fnaydeq 2010 - 2016)	Two critical water management problems in Jurd Qaytaa: (i) a solid waste dump located above Fnaydeq Spring, directly contaminating the spring; (ii) untreated wastewater from households and tourist facilities in Qamouaa polluting the aquifer. A COOPI-funded project is currently rehabilitating the solid waste sorting facility in Meshmesh. A 2013 AICS loan (~USD 14M) for a wastewater treatment station serving four municipalities (Fnaydeq, Meshmesh, Qornet, Beit Ayoub) has stalled since inception and is now being revived through CDR — the station's capacity design needs to be updated from the 2013 baseline. The Union of Municipalities holds a GIS-mapped inventory of wells, springs, and

			water ponds (collected during the 2022 Cholera pandemic) available on ArcGIS.
10	18-mars-26	Kevin Bonel (UNICEF), Mohamad El Dheiby (UN-Habitat), Dr. Kamal Khazaal (Hydrogeologist, former member of Al-Jumi Union of Municipalities, expert on Akkar water systems)	Al-Kamouaa basin is the primary recharge source for the Al-Jumi aquifer, which supplies drinking water to approximately half of Akkar; it is critically threatened by unregulated human activity (bungalows, crop cultivation with pesticides/fertilizers, open dumping). Major springs in Al-Jumi have dried: groundwater level has dropped from 10–15 m to 70 m depth due to chronic over-pumping. A 3.2 km gravity canal from Jabal Aruba to Al-Kamouaa to increase recharge by ~54% has been proposed and endorsed by the NLWE technical directorate. The Beno wastewater treatment station (serving 3 villages) is partially dismantled and urgently requires rehabilitation. Two contradicting government decrees on Al-Kamouaa (1991 MoE preservation decree vs. 1993 MoT tourism decree) are both unenforced — the resulting governance gap must be explicitly addressed in the project design.
11	20- Mai-26	Kevin Bonel (UNICEF) Elias Abinajem (UN-Habitat) - Consultative workshop to present UNICEF Adaptation project portfolio (~60m\$ of project secured and in the pipeline)	<u>Workshop Objective</u> The workshop brought together government entities, GCF, UNICEF, donors, UN agencies, academia, NGOs, and technical partners to review, refine, and validate proposed Climate Change Adaptation Project activities focused on strengthening water security and sustainable water resource management in Lebanon. Discussions aimed to ensure alignment with national priorities, avoid duplication, and strengthen the project concept before submission. The agenda included: - Opening remarks and workshop objectives - GCF strategic framing and financing approach - National adaptation priorities (NDC/NAP) - Ministry of Energy and Water proposed interventions - UNICEF climate adaptation portfolio - Group discussions and technical validation - Plenary restitution and next steps Feedbacks limited to the AF complementarity are presented here after, <u>On the Integrated Hydrological Information System (IHIS)</u> Participants broadly validated the need for a unified national monitoring and information system, recognizing that Lebanon's water data landscape is currently fragmented, poorly coordinated, and suffering from overlapping institutional mandates. Group 1 discussions centered on the IHIS as the backbone of climate-informed water governance, with the following key feedback points: • Institutional clarity is essential: Before deploying the IHIS, there must be clear delineation of mandates between the Ministry of Energy and Water, water establishments, and other line agencies to avoid further fragmentation. • Build on what exists: Participants strongly emphasized that the IHIS must integrate and build upon existing systems and donor-

funded investments — including Dutch, Swiss, KfW, and EU-supported initiatives — rather than creating parallel structures.

- **Standardization and SOPs:** The absence of standardized data-sharing protocols was flagged as a critical gap. Developing and enforcing SOPs for data collection, calibration, and sharing across institutions is a prerequisite for IHIS functionality.
- **Expand monitoring coverage:** The IHIS should expand beyond current gaps to include groundwater, surface water, springs, rivers, snow monitoring, and meteorological stations — feeding into early warning systems and predictive analytics.
- **Governance first:** Strengthening coordination mechanisms and institutional capacity at the ministry and establishment level was seen as foundational to IHIS sustainability.

On the Nature Based Solutions (NbS) for Wastewater treatment :
Group 3 discussions on wastewater and NbS generated substantive feedback with a forward-looking orientation toward the Adaptation Fund (AF) as a potential complementary financing mechanism:

- **Strong interest in NbS approaches:** Participants affirmed the relevance of constructed wetlands, decentralized treatment systems, and nature-based wastewater solutions — particularly in rural and peri-urban contexts where conventional infrastructure is cost-prohibitive or governance-constrained. Akkar's dispersed settlement pattern makes it well suited for decentralized and NbS-based approaches.
- **Regulatory and social prerequisites:** Feedback highlighted that regulatory frameworks governing treated wastewater reuse and sludge management remain underdeveloped in Lebanon. Social acceptance challenges — particularly around treated water reuse for irrigation — must be addressed through awareness and third-party verification before scaling up.
- **Sludge management pathways:** Multiple reuse options were discussed (composting, fuel pellets, cement incorporation, solar drying, pyrolysis), but participants stressed that feasibility assessments and market analyses must precede any investment decisions.
- **Scaling decentralized systems:** Participants recognized that pilot and demonstration sites in areas like Akkar could serve as proof-of-concept for NbS wastewater treatment at scale — an approach well aligned with AF's focus on replicable, community-level adaptation solutions.
- **AF as a complementary vehicle:** The discussion implicitly acknowledged that GCF financing — oriented toward transformational, system-level change — may be better suited to the IHIS and large infrastructure components, while the **Adaptation Fund**, with its direct access modality and focus on local-level, community-driven adaptation, could be a more appropriate and agile vehicle for piloting NbS wastewater treatment in Akkar. This dual-track approach would allow the GCF concept note to remain focused and investable, while AF pursues the decentralized NbS demonstration work in parallel.

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

The requested funding reflects the full cost of adaptation required to contribute to addressing Akkar's systemic, climate-driven water crisis in a sustainable, scalable, and cost-effective manner. The project goes beyond isolated infrastructure investments by combining data systems, nature-based solutions (NbS), and capacity building, ensuring long-term resilience, strong value for money, and high return on investment.

1. High Value for Money through Cost-Effective Nature-Based Solutions

A central pillar of the project is the use of NbS, which provides high adaptation impact at significantly lower cost compared to conventional infrastructure:

- Constructed wetlands and rainwater harvesting systems require lower capital investment and minimal operation and maintenance costs.
- They are low-tech, energy-efficient, and locally manageable, making them particularly suitable in Lebanon's current economic context.
- They reduce reliance on expensive groundwater pumping and centralized wastewater systems.

This ensures long-term financial sustainability and generates strong returns on investment (ROI) through reduced operational costs, improved water availability, and avoided health and environmental damage.

2. Foundational Investment in Data Systems to Enable Systemic Impact

The lack of reliable data is one of the most critical barriers to effective climate adaptation and water management in Lebanon. This project addresses this gap through a real-time water monitoring network and hydrogeological database, which is a transformational investment:

- Enables evidence-based water allocation and regulation, aligning groundwater extraction with sustainable recharge rates.
- Supports early warning and risk management for droughts and seawater intrusion.
- Strengthens national systems in line with NDC 3.0 and NWSS priorities.

Importantly, this investment will unlock future funding and scaling opportunities by:

- Providing credible data required for bankable projects and donor confidence.
- Supporting replication across other regions.
- Establishing a long-term national asset for water governance.

This makes the project not only impactful at the local level, but also strategically catalytic at the national level, particularly considering the ongoing development of a Green Climate Fund (GCF) project by UNICEF and overall Climate Change Adaptation portfolio project of 60m\$ secured and anticipated projects. This initiative

aims to support the establishment of a national Integrated Hydro-Information System (IHIS), strengthen the deployment of Nature-based Solutions (NbS) across other regions of the country, and advance water reuse practices.

3. Strong Return on Investment through Avoided Future Costs

The project represents a preventive investment that significantly reduces long-term economic risks:

- Avoids irreversible aquifer depletion and seawater intrusion, which are extremely costly to remediate.
- Reduces public health costs linked to water contamination and waterborne diseases.
- Minimizes economic losses from floods and droughts exacerbated by poor water management.

By addressing root causes rather than symptoms, the project delivers long-term savings that outweigh initial investment costs, ensuring a strong economic justification.

4. Sustainability through Capacity Building and Local Ownership

A key justification for the funding is the project's strong focus on capacity building and locally led adaptation, ensuring sustainability beyond the project lifecycle:

- Local institutions (NLWE, municipalities) will be equipped to operate, maintain, sustain, and utilize systems independently.
- Communities and farmers will adopt water-efficient practices, directly reducing pressure on groundwater resources.
- Community-based governance including youths structures will ensure long-term oversight, accountability, and behavioral change.
- Component 3 will include grant-readiness and financial capacity-building activities targeting municipalities and community committees to independently prepare and submit funding applications to climate finance mechanisms beyond the project's duration.

This approach transforms beneficiaries into active managers of water resources, significantly increasing the durability and effectiveness of investments.

5. Optimization of Water Resources through Integrated Approach

By combining data, infrastructure, and human capacity, the project enables a shift toward optimized and efficient water resource management:

- Groundwater extraction is aligned with sustainable limits.
- Water demand is reduced through efficiency and alternative sources.
- Water quality is improved through treatment and reuse.

This integrated approach ensures that every dollar invested contributes to systemic

and measurable resilience gains.

6. Scalability and Replication Potential

The project is designed as a scalable model for Lebanon:

- Monitoring systems, NbS solutions, and governance approaches can be replicated in other regions facing similar challenges.
- The inclusion of replication toolkits (especially hydrogeological modeling) and plans ensures knowledge transfer and expansion, that would support country wide possible replication from the anticipated support from GCF for the country wide development of the IHIS system.
- This significantly increases the overall return on investment, as benefits extend beyond the initial project area.

7. Leveraging Existing Investments and Maximizing Impact

The project builds on and complements existing initiatives, ensuring efficient use of resources. It:

- Enhances the effectiveness of previous investments (e.g., SCADA systems, NbS and reuse pilot projects).
- Helps avoid duplication while filling critical gaps in data, sustainability, and local capacity.

This ensures that the requested funding delivers multiplied and optimized impact.

8. Broader Economic, Social, and Environmental Co-Benefits

The project generates multi-sectoral benefits, further strengthening its value:

- Reduced groundwater extraction pressure under drought conditions.
- Improved resilience of irrigation systems to water scarcity.
- Reduced flood risk through improved water retention.
- Reduced water consumption with smart irrigation promotion to Improve agricultural productivity and livelihoods.
- Reduced public health risks.
- Lower energy consumption.
- Ecosystem restoration and environmental protection

These co-benefits ensure compounded returns across sectors, maximizing the effectiveness of the investment.

Ultimately, the requested funding addresses comprehensively an adaptation gap in Akkar through a cost-effective, data-driven, and locally sustainable approach. By investing in low-cost NbS, strategic data systems, and strong institutional capacity, the project delivers:

- High value for money

- Strong and long-term return on investment
- Sustainable and scalable impact

It represents not only a critical intervention for Akkar, but also a replicable national model capable of unlocking future climate finance and supporting Lebanon's long-term water security and climate resilience.

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

Sustainability has been a core design principle of the proposed project. The intervention adopts a long-term, systems-based approach that ensures financial, environmental, and social sustainability, while being firmly anchored in national strategies and institutional frameworks. By combining low-cost technologies, locally led adaptation, and institutional strengthening, the project is designed to deliver durable adaptation outcomes beyond the project lifecycle.

1. Financial Sustainability

The project prioritizes cost-effective and low-operation solutions to ensure affordability and continuity after project completion:

- The adoption of NbS, such as constructed wetlands and rainwater harvesting systems, significantly reduces both capital and operation and maintenance (O&M) costs compared to conventional infrastructure. O&M costs are expected to remain minimal, making them manageable for local institutions.
- The project minimizes financial burden by utilizing and upgrading existing infrastructure (e.g., wells, meteorological stations, SCADA systems), thereby reducing capital expenditure.
- Capacity building of the North Lebanon Water Establishment (NLWE) and municipalities ensures that local actors can independently operate and maintain systems, reducing reliance on external funding.
- The development of a robust water data system enhances the ability of national and local institutions to mobilize future climate finance, design bankable projects, and attract additional investments.

This approach ensures that the project outcomes remain financially viable and self-sustained over time.

2. Environmental Sustainability

Environmental sustainability is embedded through the promotion of ecosystem-based approaches and resource-efficient interventions:

- NbS interventions, including constructed wetlands, contribute to long-term improvement of water quality, reduction of untreated wastewater discharge, and restoration of ecosystem services.
- Rainwater harvesting and improved water management practices reduce

pressure on overexploited groundwater resources, contributing to aquifer recovery and limiting seawater intrusion.

- The project supports integrated water resource management, aligning water abstraction with natural recharge rates based on scientific data.
- Ecosystem restoration elements contribute to enhanced resilience to climate risks, mostly droughts.

These interventions ensure that adaptation measures do not create environmental trade-offs, but instead strengthen natural systems as a foundation for resilience.

3. Social Sustainability and Local Ownership

The project is grounded in locally led adaptation (LLA) principles, ensuring strong community ownership and long-term sustainability:

- Local institutions (NLWE, municipalities and local service providers) are positioned as primary actors, with strengthened technical and operational capacities to sustain project outcomes.
- Communities, including vulnerable groups such as women, smallholder farmers, and displaced populations, are actively engaged in planning, implementation, and monitoring processes.
- The establishment of community water stewards and monitoring committees ensures continued local oversight, accountability, and behavioral change.
- Targeted capacity building promotes water-efficient practices, leading to sustained reductions in water demand and improved resource management.

By embedding knowledge, ownership, and responsibility at the local level, the project ensures that outcomes are socially accepted, inclusive, and maintained over time.

4. Institutional and Policy Sustainability through National Alignment

The project is fully aligned with Lebanon's key policy frameworks, ensuring institutional anchoring and long-term relevance:

- It directly supports the implementation of Lebanon's Nationally Determined Contribution (NDC 3.0, 2025), particularly in relation to water monitoring systems and nature-based solutions.
- It operationalizes priorities identified in the National Adaptation Plan (NAP, 2025), including wastewater treatment through NbS and targeted interventions in water-scarce regions such as Akkar.
- It contributes to the objectives of the National Water Sector Strategy (NWSS 2024–2035), particularly in strengthening water data management and improving water security.
- Compliance with national standards (e.g., MoE Decision 8/1 and LIBNOR 814-2024) ensures that interventions are technically sound and institutionally endorsed.

By aligning with national strategies and strengthening institutional systems, the project ensures that its outcomes are embedded within long-term national planning

processes and governance structures.

In essence, the sustainability of the project is ensured through a holistic design that integrates financial viability, environmental integrity, social inclusion, and institutional alignment. By combining low-cost NbS, robust data systems, and strong local capacity, the project creates a self-sustaining model of climate adaptation that will continue to deliver benefits well beyond the duration of external funding, while also enabling replication and scaling at the national level.

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

Checklist of environmental and social principles	No further assessment required for compliance	Potential impacts and risks – further assessment and management required for compliance
<i>Compliance with the Law</i>		All activities will comply with national regulations (e.g., environmental standards, water laws, EIA decree). Further assessment required to ensure all permits, approvals, and environmental screenings (IEE) are secured prior to implementation.
<i>Access and Equity</i>		Risk of unequal access to project benefits (e.g., water services, NbS interventions). Measures required to ensure fair and inclusive access, especially for vulnerable communities.
<i>Marginalized and Vulnerable Groups</i>		Risk of exclusion of vulnerable groups (refugees, women, smallholder farmers). Requires targeted engagement, inclusive consultations, and equitable benefit-sharing mechanisms.
<i>Human Rights</i>	Project is not expected to negatively affect human rights. It aims	

	to improve access to water and basic services. No adverse impacts anticipated.	
<i>Gender Equality and Women's Empowerment</i>		Risk of limited participation of women in decision-making. Mitigation through gender-responsive programming, quotas, and targeted community engagement and capacity building.
<i>Core Labour Rights</i>		Potential risks related to labour conditions during construction (e.g., safety, fair compensation). Requires enforcement of labour standards, occupational health and safety (OHS) measures, grievance mechanisms and contractor compliance.
<i>Indigenous Peoples</i>	No Indigenous Peoples as defined under the AF policy are present in the project area.	
<i>Involuntary Resettlement</i>	No land acquisition or physical/economic displacement is anticipated. NbS will be implemented on publicly owned or voluntarily provided land.	
<i>Protection of Natural Habitats</i>		Minor risks during construction (e.g., disturbance of local habitats). NbS expected to have net positive impacts. Site-specific assessments required during Environmental screening and EIA if deemed necessary from screening.
<i>Conservation of Biological Diversity</i>		Potential localized impacts during installation works. Requires screening and

		mitigation measures. Overall positive impact expected through ecosystem restoration.
<i>Climate Change</i>	Project is designed to enhance climate resilience and has no negative climate impact.	
<i>Pollution Prevention and Resource Efficiency</i>		Temporary construction-related pollution risks (waste, noise, minor emissions). Mitigation measures required with the contractor. NbS will significantly reduce long-term pollution.
<i>Public Health</i>		Risks during construction (e.g., worker safety, community disturbance). Requires health and safety measures. Positive impacts expected through improved water quality.
<i>Physical and Cultural Heritage</i>		Very low risk of chance finds during excavation works. Requires monitoring during excavation and compliance with national regulations.
<i>Lands and Soil Conservation</i>		Minor risks of soil disturbance and erosion during construction. Mitigation through proper site management and NbS design.

PART III: IMPLEMENTATION ARRANGEMENTS

A. Demonstrate how the project/programme aligns with the Results Framework of the Adaptation Fund

The project is strategically anchored within the Adaptation Fund's Results Framework (RF), directly contributing to **Outcome 2: Strengthened institutional capacity to reduce risks associated with climate-induced socioeconomic and environmental losses**; **Outcome 3: Strengthened awareness and ownership of adaptation and climate risk reduction processes**; **Outcome 4: Increased adaptive capacity within relevant development sector services and infrastructure assets**; **Outcome 5: Increased ecosystem resilience in response to climate change and variability-induced stress**; **Outcome 6: Diversified and strengthened livelihoods and sources of income for vulnerable people in targeted areas**. This alignment reflects the project's climate adaptation objective of strengthening the resilience of Akkar's water resources, institutions, infrastructure, ecosystems, and vulnerable communities to increasing climate variability, prolonged droughts, groundwater depletion, and other climate-induced water security risks through integrated, climate-informed water resources management.

At the output level, the project maps across five Fund outputs, ensuring a comprehensive and mutually reinforcing results chain. The first project outcome, **improving availability and use of real-time hydrological and hydrogeological data**, directly feeds into **Outputs 2.1 and 4.1**, strengthening both institutional capacity to understand climate risks and the resilience of water infrastructure assets. The second outcome, centered on **nature-based solutions (NbS) for water quality improvement**, aligns with **Outputs 5 and 6**, addressing ecosystem service protection while strengthening community livelihoods dependent on water resources. The third outcome, **building the capacity of local institutions and communities**, corresponds to **Outputs 3.1 and 3.2**, ensuring that adaptation knowledge is embedded at the subnational level and that vulnerable groups actively participate in risk reduction processes.

Together, these linkages demonstrate a coherent theory of change that moves from evidence generation and infrastructure resilience, through ecosystem restoration, to institutional and community ownership, all essential pillars of durable climate adaptation in a fragile context.

Project Objective(s) ¹	Project Objective Indicator(s)	Fund Outcome	Fund Outcome Indicator	Grant Amount (USD)

Enhance climate resilience and water security in Akkar through a data-driven and nature-based approach that empowers local institutions and communities to lead adaptation efforts	Number of people benefiting from improved climate-resilient water management systems (disaggregated by sex, age and disability)	Outcome 2: Strengthened institutional capacity to reduce risks associated with climate-induced socioeconomic and environmental losses Outcome 3 : Strengthened awareness and ownership of adaptation and climate risk reduction processes Outcome 4: Increased adaptive capacity within relevant development sector services and infrastructure assets	Number of Institutions with strengthened capacity to understand and better address climate risks and resilience Number of People with strengthened awareness of climate change risks and how to better address them Number of development sector services and infrastructure assets (water systems) with increased resilience to climate variability	5,000,000
Project Outcome(s)	Project Outcome Indicator(s)	Fund Output	Fund Output Indicator	Grant Amount (USD)
Improved availability and use of real-time hydrological and hydrogeological data for evidence-based water management	Number of hydrometeorological and groundwater monitoring stations installed and operational Number of institutions regularly using real-time hydrological/hydrogeological data for water management decisions Number of recommendations, decisions or actions informed by the evidence-based data reflecting improved decision making	Output 2.1 Strengthened capacity of institutions to understand and better address climate risks and Output 4.1 Vulnerable development sector services and infrastructure assets strengthened in response to climate change impacts,	Number of Institutions supported to strengthen capacity to understand and address climate risks and resilience Number of Development sector services strengthened to respond to climate variability and change	2,197,800

		including variability		
Improved water quality and reduced pressure on groundwater through nature-based solutions	Percentage reduction in groundwater over-extraction rates in targeted aquifer areas Percentage of efficiency of the treatment of wastewater through NbS	Output 5: Vulnerable ecosystem services and natural resource assets strengthened in response to climate change impacts, including variability And Output 6 Targeted individual and community livelihood strategies strengthened in relation to climate change impacts, including variability	Number of natural resources targeted by activities to improve protection, restoration, and/or management Number of People receiving targeted support for new and/or improved livelihoods to manage climate risk	1,663,200
Enhanced capacity of local institutions and communities to sustainably manage water resources and adaptation interventions	Number of individuals (disaggregated by sex, age, and vulnerability status) participating in climate adaptation and water risk reduction awareness activities Percentage of trained local institution staff demonstrating improved competency in climate adaptation planning (post-training assessment) Number of cazas/governorates receiving the replication toolkit	Output 3.1: Targeted population groups participating in adaptation and risk reduction awareness activities and Output 3.2: Strengthened capacity of national and subnational stakeholders and entities to capture and disseminate knowledge and learning	Number of People participating in activities to improve awareness of climate risks and how to address them Number of Climate resilience knowledge products and/or tools developed and shared with stakeholders	405,940

¹ The AF utilized OECD/DAC terminology for its results framework. Project proponents may use different terminology but the overall principle should still apply

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

A. Record of endorsement on behalf of the government² *Provide the name and position of the government official and indicate date of endorsement. If this is a regional project/programme, list the endorsing officials all the participating countries. The endorsement letter(s) should be attached as an annex to the project/programme proposal. Please attach the endorsement letter(s) with this template; add as many participating governments if a regional project/programme:*

<i>Tamara El Zein Minister of Environment - Lebanon</i>	<i>Date: July 3, 2025</i>
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REPUBLIC OF LEBANON
MINISTRY OF ENVIRONMENT

THE MINISTER

Beirut, 3/7/2025
Ref.: 2451/B/2025

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

Subject : Endorsement for "Nature-based Water Management & Data-Driven Strategy for Climate Resilience in Akkar, Lebanon" Project

In my capacity as designated authority for the Adaptation Fund in Lebanon, I confirm that the above national grant proposal is in accordance with the government's national priorities in implementing adaptation activities to reduce adverse impacts of, and risks, posed by climate change in Lebanon.

Accordingly, I am pleased to endorse the above grant proposal with support from the Adaptation Fund. If approved, the project will be implemented by UN-Habitat and executed by UNICEF, North Lebanon Water Establishment (NLWE), Lebanese Agriculture Research Institute (LARI), Municipalities, Local NGOs, Academic institutions, and Private technical consultancy firm.

Sincerely,

Minister of Environment
Tamara El-Zein, PhD



Cc: - United Nations Human Settlements Programme (UN House, riad El Solh, +961 1 978398, Beirut, Lebanon)
- MoE - DGoE - Service of Environmental Technology - Department of Air Quality
- MoE - Climate Change Projects

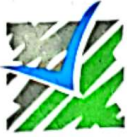
Ministry of Environment, Lazarieh Center, 7th Floor, Block A-4 Old
P.O.Box: 11/2727; Beirut-Lebanon. Tel: +(961)-1-976555 or 4-Digit Number: 1789; Fax: +(961)-1-976530
Home Page: www.moe.gov.lb

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

I certify that this proposal has been prepared in accordance with guidelines provided by the Adaptation Fund Board, and prevailing National Development and Adaptation Plans (NAP and NDC 3.1) and subject to the approval by the Adaptation Fund Board, commit to implementing the project/programme in compliance with the Environmental and Social Policy and the Gender Policy of the Adaptation Fund and on the understanding that the Implementing Entity will be fully (legally and financially) responsible for the implementation of this project/programme.

⁶. 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.

Raf Tuts  Implementing Entity Coordinator	
Date: August 5 2026	Tel. and email: +254 713 601278 raf.tuts@un.org
Project Contact Person: Tarek Osseiran	
Tel. and Email: +961 3 233671 – tarek.osseiran@un.org	



REPUBLIC OF LEBANON
MINISTRY OF ENVIRONMENT

THE MINISTER

Beirut, 3/7/2025
Ref.: 2451/B/2025

The Adaptation Fund Board
c/o Adaptation Fund Board Secretariat
Email: Secretariat@Adaptation-Fund.org
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- MoE - DGoE - Service of Environmental Technology – Department of Air Quality
- MoE - Climate Change Projects



Revised PFG Submission Form¹ (additions in red)

Project Formulation Grant (PFG)

Submission Date: 13 July 2026

Adaptation Fund Project ID: AF00000446

Country/ies: Lebanon

Title of Project/Programme: Nature-based Water Management & Data-Driven Strategy for Climate Resilience in Akkar, Lebanon

Type of IE (NIE/RIE/MIE): MIE

Implementing Entity: United Nations Human Settlements Program (UN-Habitat)

Executing Entity/ies: United Nations Children's Fund (UNICEF)- Lebanese Agriculture Research Institute (LARI) – North Lebanon Water Establishment (NLWE)

A. Project Preparation Timeframe

Start date of PFG	For Proposal preparation (October 2026)
Completion date of PFG	End of Proposal submission (July 2027)

B. Proposed Project Preparation Activities (\$)

Table: PFG for the full proposal development

Please describe below each of the PFG activities and provide justifications for their need and for the amount of funding required:

For LLA Projects only:

If requesting additional funding for LLA projects to enable devolving decision making to the local level, please specify the activities that would directly serve to enable devolving decision making to the lowest appropriate level and enable local actors to make informed decisions on how adaptation actions are defined, prioritized, designed, and implemented:

Please provide justifications for their need and for the amount of additional funding required:

Rationale for the Project Formulation Grant (PFG) Request

The Project Formulation Grant (PFG) request has been structured into two complementary applications of **USD 100,000** each, for a total of **USD 200,000**, to support the preparation of a Full Project Proposal for submission to the Adaptation Fund. The proposed project aims to strengthen climate resilience in the Akkar region of northern Lebanon.

¹ As presented in AFB/PPRC.33/40 Annex 1.

The PFG is essential to enable the Implementing Entity (IE) and Executing Entities (EEs) to undertake the data collection, technical assessments, institutional consultations, and community engagement required to design a cost-effective, evidence-based, and participatory climate adaptation project.

PFG 1, presented in the first section below, provides the minimum level of support required to prepare a technically sound and Adaptation Fund-compliant Full Project Proposal. It will finance the proposal development process, baseline assessments, feasibility studies, stakeholder consultations, initial Nature-based Solutions (NbS) scoping, and Focus Group Discussions (FGDs) required to validate community priorities and inform the design of the proposed intervention.

PFG 2, presented in the second section below, will further strengthen the technical rigor, precision, and transformational potential of the proposed project. It will support detailed climate risk assessments, geological and hydrogeological investigations, and locally led adaptation planning. This additional support will enable the project to refine its geographical focus to one or two priority catchments and establish a scientifically robust hydrometeorological monitoring framework, including stream gauges, weather stations, and multi-depth piezometers. These investigations will improve understanding of groundwater dynamics, aquifer interactions, and climate impacts, thereby enhancing the targeting, design, cost-effectiveness, and long-term sustainability of proposed adaptation investments.

Together, the two PFG applications provide the level of preparation required to develop a robust, evidence-based, and investment-ready project addressing the complexity of climate adaptation challenges in Akkar. Without these preparatory resources, it would not be possible to adequately scope, prioritize, cost, and validate the proposed interventions to the technical standards expected by the Adaptation Fund.

Beyond supporting proposal preparation, the PFG represents a strategic investment in the long-term quality, sustainability, and impact of the project. The Akkar region faces multiple and compounding climate challenges, including increasing rainfall variability, prolonged droughts, groundwater depletion, seawater intrusion, and deteriorating hydrometeorological infrastructure. Addressing these interconnected risks requires technically rigorous, scientifically sound, community-driven, and institutionally anchored adaptation solutions.

By supporting both PFG applications, the Adaptation Fund will enable the development of a Full Project Proposal that is scientifically robust, operationally feasible, institutionally owned, and responsive to the priorities of vulnerable communities. The resulting project will be better positioned to deliver sustainable and transformative climate adaptation outcomes while strengthening Lebanon's capacity for integrated and climate-resilient water resources management.

PFG 1 - Proposal Development, NbS Scoping and Initial Validation

List of Proposed Project Preparation Activities	Output of the PFG Activities	US\$ Amount	Budget Note
1. Proposal development			
1.1 Consultant fees	Proposal template and Annexes developed in compliance with AF Standards	\$ 70,000.00	This relates to hiring an individual consultant who will be in charge of compiling all materials developed during the PFGs and support

			developing the full proposal
Subtotal 1:		\$ 70,000.00	
2. NbS Scoping and Community Validation			
2.1 NbS expert for the selection of locations	Selection of the locations to install NbS and selection of the NbS typology as well as the different locations.	\$ 6,000.00	Partial fees for a NbS expert consulting firm for 6 months to assess the different villages, identify the public land suitable for the NbS installation and assess the network conditions to identify the cost for repair, separation from rainwater and ESS needs
2.2 Conduct a series of Focus Group Discussions (FGDs) with different stakeholders	Organization of FGD with community and local stakeholders to revise and refine the proposed interventions and deeply understand their willingness to contribute and engage within the project.	\$ 2,400.00	Partial fees for experts who will be conducting focus group discussions with a variety of stakeholders and analyze the outcomes for project purposes
		\$ 5,765.90	Logistics and expenses to conduct the initial FGDs
2.3 Climate Adaptation EE staffs	EE staffing to monitor and ensure transparency of investments and quality assurance of the produced documentation.	\$ 8,000.00	Management of the consultant and revision of the findings and BoQ produced by the different experts and consulting firms
Subtotal 2 (validation):		\$ 22,165.90	
IE fees (8.5%)		\$ 7,834.10	Calculated on Subtotal 1 and Subtotal 2
Total Project Formulation Grant		\$ 100,000.00	Sum of Subtotal 1, Subtotal 2 and IE fees

The first PFG is structured around **two thematic areas**, each involving distinct stakeholders, technical disciplines, and institutional partners.

Component 1 — Proposal Development

Rationale

The preparation of a full Adaptation Fund project proposal demands a high level of technical precision, procedural compliance, and institutional coordination. To meet the Fund's quality standards, the IE will contract an individual consultant with demonstrated experience in developing proposals for the Adaptation Fund. This consultant will be responsible for synthesising all technical

assessments, community consultation findings, and institutional agreements into a coherent, compliant, and compelling full project submission.

Component 2 — Technical Assessments – NbS Scoping and Community Validation

Rationale

The project includes a Nature-based Solutions component targeting communities across Akkar. The identification and validation of suitable NbS typologies and installation sites requires dedicated field-based assessment. A specialised NbS expert consulting firm will be retained for six months to conduct village-level assessments, identify publicly owned land suitable for NbS installation, and assess the condition of existing water distribution networks to identify repair, stormwater separation requirements, and Environmental and Social Standards (ESS) needs, including associated cost estimates.

To secure community ownership, a series of structured Focus Group Discussions (FGDs) will be conducted at governorate and sub-municipal levels. These consultations will validate community understanding of local climate adaptation needs, gather structured stakeholder input on the proposed project components, and ensure early and active involvement of vulnerable communities. Climate Adaptation EE staff will oversee and quality-assure all consultant deliverables and FGD outcomes throughout this phase.

PFG 2 - Detailed Technical Assessment and Locally Led Adaptation

List of Proposed Project Preparation Activities	Output of the PFG Activities	US\$ Amount	Budget Note
1. Detailed Technical Assessment			
1.1 Hydrologist and Hydrogeologist expert	Define the ideal coverage of monitoring stations, ensure interoperability and define the Stream catchment, conduct MCDA for area selection, and assess the gap needed to be filled to fully develop a 3D geological and Hydrogeological model to properly identify the recharge mechanism and enable the future proper management of the Water allocation limited to the yearly recharge	\$ 50,000.00	Fees for the water resources experts to conduct the technical assessments required to identify and prioritize the target locations, delineate the priority river basins and groundwater catchments, and define the investments and additional hydrogeological investigations needed. This shall include assessments of the physical, hydrological, hydrogeological, and hydrochemical characteristics of the selected aquifers to inform the design of

			climate adaptation interventions.
1.2 Meteorological / Climate expert	Define the ideal coverage of weather monitoring stations including snow cap monitoring, ensure interoperability with the system and define the minimum standards needed to develop a model for the water balance (defining efficient precipitation, soil humidity, evapotranspiration, etc.)	\$ 10,000.00	expert or consulting firm to prepare the BoQ and the cost estimate for the weather stations
1.3 Modeling and GIS experts	Ensure that the minimum requirement of monitoring stations enables the future development of Hydrogeological models and support the different Experts in data management.	\$ 10,000.00	Fees for the GIS experts who will support the technical assessment for the selection of locations to support the groundwater monitoring and “Sustainable Water Resource Management”.
1.4 Climate Adaptation EE staffs	EE staffing to monitor and ensure transparency of investments and quality assurance of the produced documentation.	\$ 5,000.00	Management of the consultant and revision of the findings and BoQ produced by the different experts and consulting firms
Subtotal 1 (Hydrogeological modeling):		\$ 75,000.00	
2. NbS Scoping and Community Validation			
Environmental expert	ESS and Environmental screening	\$ 12,000.00	
2.1 WasteWater Experts to Assess needs for NbS and additional project to the civil society and identify possible youth support to the different	Organization of FGD with community and local stakeholders to revise and refine the proposed interventions and deeply understand their willingness to contribute and engage with in the project	\$ 17,165.90	Additional fees to clearly support the development of the LLA Part and complementing the community-facing work under PFG 1
Subtotal 2 (NbS and LLA):		\$ 17,165.90	

IE fees (8.5%)		\$ 7,834.10	Calculated on Subtotal 1 and Subtotal 2
Total Project Formulation Grant		\$ 100,000.00	Sum of Subtotal 1, Subtotal 2 and IE fees

This second PFG request is driven by the need to undertake more detailed climate risk assessments, geological, hydrological, and hydrogeological investigations, and locally led adaptation planning activities that go beyond what can be achieved under PFG 1 alone. Specifically, PFG 2 will enable the project to:

- Refine the geographical focus to **one or two priority catchments**, based on multi-criteria decision analysis (MCDA) and hydrogeological modelling.
- Develop a **robust hydrometeorological monitoring network** — including stream gauges, weather stations, and multi-depth piezometers — to better understand groundwater dynamics, aquifer interactions, and climate impacts.
- Assess the physical, hydrological, hydrogeological, and hydrochemical characteristics of the selected aquifers to inform the design of climate adaptation interventions.
- Strengthen the **Locally Led Adaptation (LLA)** dimension of the project by deepening community engagement, particularly with civil society organisations and youth groups.

These additional analyses are not duplicative of PFG 1 activities. Rather, they represent the next level of technical investigation required to move from a feasibility-level assessment to a fully scoped, investment-ready project capable of delivering measurable and lasting climate adaptation outcomes.

Component 1 — Detailed Hydrogeological and Climate Technical Assessment Rationale

The Akkar region is underlain by a complex multi-aquifer system that is highly sensitive to changes in precipitation patterns, land use, and groundwater abstraction. A scientifically robust assessment of groundwater dynamics is essential to design effective climate adaptation investments. This component will commission a multidisciplinary team — a Hydrologist and Hydrogeologist expert, a Meteorological/Climate expert, and Modeling and GIS experts — to define the ideal coverage of monitoring stations, delineate priority river basins and groundwater catchments, conduct a Multi-Criteria Decision Analysis (MCDA) for area selection, and assess the data gaps needed to develop a 3D geological and hydrogeological model capable of accurately identifying aquifer recharge mechanisms.

Executing Entity Climate Adaptation staff will be deployed throughout this component to manage contracts, review consultant deliverables, ensure quality assurance of all technical documentation, and validate the findings against on-the-ground realities.

A complementary costing exercise, detailed under the IHIS-stations breakdown, further defines the Bills of Quantities (BoQs) and cost estimates for weather station rehabilitation and groundwater monitoring equipment (wells, stream gauges, and SCADA connectivity), drawing on a dedicated environmental expert and water experts to refine site selection and detailed costing.

Component 2 — NbS Community Assessment and Locally Led Adaptation (LLA) Rationale

The second PFG also includes a dedicated community-facing component to ensure that the advanced technical work is grounded in the realities and priorities of local communities, with particular attention to civil society engagement and youth participation. This component will commission WasteWater and water resources experts to conduct a deeper and more targeted series of Focus Group Discussions (FGDs) specifically oriented towards identifying community-level needs for Nature-based Solutions and additional project activities directed at civil society, and mapping potential youth support mechanisms and youth-led climate adaptation initiatives that could be integrated into the full project.

This engagement complements the broader hydrogeological work under Component 1 by ensuring that technical investment decisions are validated against community priorities and that the project's Locally Led Adaptation dimension is substantively developed prior to full proposal submission.

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

The project is designed to generate tangible economic, social, and environmental benefits for vulnerable communities in Akkar, while strengthening local adaptive capacity to climate-induced water stress. The approach emphasizes participatory governance, inclusive decision-making, and community ownership, ensuring that vulnerable groups are not only beneficiaries but active actors in climate adaptation.

Community engagement mechanisms are designed to ensure that marginalized and vulnerable populations, including smallholder farmers, youth, women, persons with disabilities, and displaced populations, participate meaningfully in decision-making processes related to water management and nature-based solutions (NbS).

Participatory Planning Framework

During the project formulation phase, Focus Group Discussions (FGDs) and participatory design workshops will be conducted in each target community. These consultations will:

- Identify community priorities related to water security and climate risks
- Validate appropriate NbS typologies (e.g., constructed wetlands, rainwater harvesting systems)
- Define community roles in implementation and operation and maintenance (O&M)

Targeted sessions will be organized for women, youth, and marginalized groups to ensure their perspectives are reflected in project design and governance arrangements.

Community-Based Monitoring and Governance

To ensure sustainability and accountability, the project will establish Community Monitoring Committees responsible for overseeing the functionality, maintenance, and local oversight of NbS infrastructure and water monitoring systems. These committees will be trained and supported under Component 3 (Capacity Building and Data Governance). Youth will play an active role in community-based monitoring, awareness-raising, and local dialogue on sustainable water management, strengthening transparency and social accountability

The committees will work in coordination with the North Lebanon Water Establishment (NLWE) to strengthen institutional linkages between community-based water management and formal service providers.

Multi-dimensional Benefits

The project delivers interlinked economic, social, and environmental benefits that directly support climate resilience in Akkar while prioritizing marginalized and vulnerable populations. These outcomes are aligned with the Adaptation Fund Environmental and Social Policy (ESP) and Gender Policy (GP).

Benefit Type	Expected Benefits
Economic	• Potential and Estimated US\$200,000/year in avoided groundwater pumping costs due to reduced reliance on energy-intensive groundwater extraction (project-level estimate) • Reduced healthcare expenditures associated with waterborne diseases • Increased agricultural productivity through improved water availability and quality for irrigation • Local job creation through NbS construction, maintenance, and environmental monitoring activities
Social	• More than 300,000 indirect beneficiaries benefiting from improved water access and quality; • Inclusive consultations ensuring participation of both host communities and displaced populations • Strengthened social cohesion through participatory water governance structures • Gender-responsive programming with targeted engagement of women-led agricultural cooperatives • Reduced exposure to contaminated water sources and associated public health risks
Environmental	• Treatment of approximately 100,000 m³/year of wastewater through nature-based treatment systems such as constructed wetlands • Reduced groundwater abstraction contributing to mitigation of seawater intrusion (SWI) in coastal aquifers • Preservation of ecosystem services through NbS interventions including wetlands and rainwater harvesting systems • Reduced untreated wastewater discharge to rivers and agricultural lands • Carbon sequestration co-benefits associated with wetland ecosystems

Gender Considerations and Vulnerable Groups

The project integrates gender-responsive adaptation measures in line with the Adaptation Fund Gender Policy and Lebanon's national gender analysis frameworks. National gender assessments highlight that women often play a central role in household water management, food preparation, hygiene practices, and agricultural labor, yet

frequently face structural barriers to land ownership, decision-making authority, and access to formal agricultural support services (National Commission for Lebanese Women (NCLW) & UNDP, 2021). These challenges are particularly pronounced in rural areas such as Akkar.

Recognizing these disparities, the project adopts a gender-responsive approach aimed at strengthening women's participation in climate-resilient water governance.

Key measures include:

- Conducting a dedicated gender assessment during the PFG-funded project formulation phase, in accordance with Adaptation Fund Gender Policy requirements. This assessment will be led by EE Gender and SEA experts;
- Ensuring a minimum of 30% participation of women in all training and capacity building activities;
- Prioritizing women-led agricultural cooperatives as beneficiaries of climate-resilient water management interventions;
- Integrating gender audits within community water governance structures to ensure equitable representation;
- Collecting and monitoring sex-disaggregated data across all project indicators;

Through these measures, the project aims not only to ensure equitable access to adaptation benefits but also to strengthen women's participation in local water governance systems.

Describe the consultative process, including the list of stakeholders consulted, undertaken during project preparation, with particular reference to vulnerable groups, including gender considerations, in compliance with the Environmental and Social Policy and Gender Policy of the Adaptation Fund.

The project team composed of UNICEF and UNHABITAT conducted a series of targeted technical consultations between January and March 2026 with key national experts, academic institutions, UN agencies, water authorities, and civil society representatives active in the Akkar region. These consultations informed the design of all three project components and confirmed the relevance and local ownership of the proposed intervention.

Note on Vulnerable Groups and Gender Considerations: The ongoing security situation in Lebanon during the consultation period severely constrained the ability of the project team to conduct in-person field consultations in remote and conflict-affected areas of Akkar. As a result, it was not possible to directly engage vulnerable groups, including women, refugees, and farmers in the stakeholder consultation process at this preparatory stage. The project team acknowledges this gap and is fully committed to addressing it during the implementation phase. Dedicated consultations with vulnerable groups, including gender-disaggregated participatory assessments, will be conducted in strict compliance with the Adaptation Fund's Environmental and Social Policy (ESP) and Gender Policy, ensuring that the voices and needs of the most marginalized populations, particularly women and female-headed households; are meaningfully integrated into the final project design, monitoring framework, and all implementation activities.

#	Date	Attendees	Main Outcomes & Recommendations
1	29-janv-26	Kevin Bonel (UNICEF), Ihab Jomaa (The Lebanese Agricultural Research Institute (LARI))	LARI expressed strong interest in supporting the project across all components. LARI can contribute through capacity building and technical expertise, particularly in the design and implementation of Nature-Based Solutions (NbS), including wetlands. Regarding meteorological monitoring, LARI operates in agrometeorology, tracking: soil moisture, air humidity, temperature, rainfall, atmospheric pressure, wind speed, and solar radiation — enabling estimation of evapotranspiration (ETP), critical for water resource management. LARI will: (i) assess the status of the six meteorological stations in Akkar and identify rehabilitation needs; (ii) provide a sample monitoring dataset. UNICEF has coordinated with the Litani River Authority (LRA) on the hydrological monitoring network (stream gauges) and data access facilitation.
2	04-févr-26	Kevin Bonel (UNICEF), Alain Maroon (AFD, BTD, Water Resources Programme - WRP)	WRP has to date: equipped key pumping fields in Ain Yacoub and Al-Oyoun; installed metering systems for major springs (e.g., Jeita, Bassaas); and advanced the establishment of a SCADA control room for the North Lebanon Water Establishment (NLWE), nearing completion. A bilateral coordination meeting is recommended to: clarify WRP achievements and ongoing activities; define complementarities; and avoid duplication with PPF-supported activities.

3	05-févr-26	Kevin Bonel (UNICEF), Joanna Doummer (American University of Beirut - AUB)	AUB has developed an initial model and dataset on Seawater Intrusion (SWI) in Akkar, requiring further refinement and updated field data. There is interest in assessing the feasibility of Managed Aquifer Recharge (MAR) in Sahel Akkar (risk of clogging, effectiveness in coastal aquifers). It is critical to: define the type of model required (conceptual vs. numerical; predictive vs. scenario-based); specify decision-support objectives (MAR site selection, abstraction limits, salinity risk); and identify data gaps. Strong collaboration potential with AUB, contingent on aligning outputs with MoEW and Water Establishment needs.
4	13-févr-26	Kevin Bonel (UNICEF), Gaby Nasr (North Lebanon Water Establishment - NLWE)	Gaby Nasr was enthusiastic about the project even if the project is focussing solely on Akkar where the Water Establishment has limited concessions, but confirmed the vulnerability of the area, and detailed the works done between the AFD and the Water Establishment on the monitoring of the production wells and the SCADA systems to which this project will be connected.
5	12-mars-26	Kevin Bonel (UNICEF), Mohamad El Dheiby & Elias Abinajem (UN-Habitat), Dr. Ata Elias (Hydrogeologist Lebanese University)	Dr Elias, proposed to focus resources on one specific watershed (e.g., Ostwan River) rather than all of Akkar, to ensure a holistic, depth-focused, and replicable intervention. Strengthen monitoring for saline intrusion along riverbeds — intrusion progresses upstream via river channels, not only through direct groundwater pumping. Recommend adding snowfall monitoring at high-elevation recharge zones (Salat al-Kammoua / Jurd Akkar). Municipal capacity to manage NbS O&M is limited; recommend engaging local NGOs and civil society groups (scouts, youth, Red Cross) alongside municipalities. Promote traditional rainwater cisterns as a culturally grounded NbS for reuse and aquifer recharge.
6	13-mars-26	Kevin Bonel (UNICEF), Elias Abinajem & Mohamad El Dheiby (UN-Habitat), Saada Allaw (Legal Agenda, Head of Journalism & Human Rights Expert)	Saada conducted a 30-day fieldwork study documenting encroachments over Akkar's four rivers (Bared, Arka, Ostwan, South Kabeer), based on 20 expert interviews, field observations, photos/videos, and consultations with local authorities and Mukhtars. Key findings: all river channels and irrigation canals are heavily contaminated by wastewater and solid waste; wells used for irrigation in Sahel Akkar are also contaminated. Study includes socio-heritage analysis of the deteriorated community-river relationship. Publication postponed to May 2026 (due to ongoing hostilities); will coincide with a Beirut conference.
7	13-mars-26	Kevin Bonel (UNICEF), Mohamad El Dheiby & Elias Abinajem (UN-Habitat), Khaled Taleb (Environmental Activist, Akkar Trail / IFFT, Forestry & Ecology Expert)	Khaled leads a citizen weather station network (currently 5 stations, targeting ~20 across Akkar) collecting meteorological data (wind, rainfall, temperature) publicly accessible online since September 2025. Data supports agri-environmental forecasting and wildfire alerts for farmers. Satellite imagery (Sentinel/NDVI indices) is used as a complement where ground-station coverage is limited. Khaled participated in the Legal Agenda water study survey and confirmed availability to support project field activities. Raised concern that LARI meteorological data is not publicly accessible due to institutional data-hoarding — the project's open data platform should remedy this.

8	16-mars-26	Kevin Bonel (UNICEF), Mohamad El Dheiby (UN-Habitat), Prof. Jalal Halwani (Lebanese Canadian University, former LU Water & Environment Research Lab Founder, 30+ years on Akkar)	Identified three causes of salinity in Akkar: (i) over-extraction of irrigation wells; (ii) geothermal spring intrusion near Samakiya (sulfate-rich hot spring, discovered 1965); (iii) reduced river flow. Emphasized urgency of completing the Al-Abdi wastewater treatment plant (construction stalled) to reduce microbiological contamination in the coastal plain. Pesticide and nitrate contamination in groundwater are at catastrophic levels, farmers irrigate directly with untreated wastewater. Offered to share three PhD-level research papers on pesticide pollution and health impacts in Akkar. Proposed a field visit to Burj Al Arab (active PhD study site on water-food nexus) as a potential project demonstration site.
9	16-mars-26	Mohamad El Dheiby (UN-Habitat), Abdul Elah Zakaria (Former Head of Jurd Qaytaa Union of Municipalities, former Mayor of Fnaydeq 2010 - 2016)	Two critical water management problems in Jurd Qaytaa: (i) a solid waste dump located above Fnaydeq Spring, directly contaminating the spring; (ii) untreated wastewater from households and tourist facilities in Qamouaa polluting the aquifer. A COOPI-funded project is currently rehabilitating the solid waste sorting facility in Meshmesh. A 2013 AICS loan (~USD 14M) for a wastewater treatment station serving four municipalities (Fnaydeq, Meshmesh, Qornet, Beit Ayoub) has stalled since inception and is now being revived through CDR — the station's capacity design needs to be updated from the 2013 baseline. The Union of Municipalities holds a GIS-mapped inventory of wells, springs, and water ponds (collected during the 2022 Cholera pandemic) available on ArcGIS.
10	18-mars-26	Kevin Bonel (UNICEF), Mohamad El Dheiby (UN-Habitat), Dr. Kamal Khazaal (Hydrogeologist, former member of Al-Jumi Union of Municipalities, expert on Akkar water systems)	Al-Kamouaa basin is the primary recharge source for the Al-Jumi aquifer, which supplies drinking water to approximately half of Akkar; it is critically threatened by unregulated human activity (bungalows, crop cultivation with pesticides/fertilizers, open dumping). Major springs in Al-Jumi have dried: groundwater level has dropped from 10–15 m to 70 m depth due to chronic over-pumping. A 3.2 km gravity canal from Jabal Aruba to Al-Kamouaa to increase recharge by ~54% has been proposed and endorsed by the NLWE technical directorate. The Beno wastewater treatment station (serving 3 villages) is partially dismantled and urgently requires rehabilitation. Two contradicting government decrees on Al-Kamouaa (1991 MoE preservation decree vs. 1993 MoT tourism decree) are both unenforced — the resulting governance gap must be explicitly addressed in the project design.
11	20- Mai-26	Kevin Bonel (UNICEF) Elias Abinajem (UN-Habitat) - Consultative workshop to present UNICEF Adaptation project portfolio (~60m\$ of project secured and in the pipeline)	<u>Workshop Objective</u> The workshop brought together government entities, GCF, UNICEF, donors, UN agencies, academia, NGOs, and technical partners to review, refine, and validate proposed Climate Change Adaptation Project activities focused on strengthening water security and sustainable water resource management in Lebanon. Discussions aimed to ensure alignment with national priorities, avoid duplication, and strengthen the project concept before submission. The agenda included: - Opening remarks and workshop objectives - GCF strategic framing and financing approach - National adaptation priorities (NDC/NAP) - Ministry of Energy and Water proposed interventions

- UNICEF climate adaptation portfolio
- Group discussions and technical validation
- Plenary restitution and next steps

Feedbacks limited to the AF complementarity are presented here after,
On the Integrated Hydrological Information System (IHIS)

Participants broadly validated the need for a unified national monitoring and information system, recognizing that Lebanon's water data landscape is currently fragmented, poorly coordinated, and suffering from overlapping institutional mandates. Group 1 discussions centered on the IHIS as the backbone of climate-informed water governance, with the following key feedback points:

- **Institutional clarity is essential:** Before deploying the IHIS, there must be clear delineation of mandates between the Ministry of Energy and Water, water establishments, and other line agencies to avoid further fragmentation.
- **Build on what exists:** Participants strongly emphasized that the IHIS must integrate and build upon existing systems and donor-funded investments — including Dutch, Swiss, KfW, and EU-supported initiatives — rather than creating parallel structures.
- **Standardization and SOPs:** The absence of standardized data-sharing protocols was flagged as a critical gap. Developing and enforcing SOPs for data collection, calibration, and sharing across institutions is a prerequisite for IHIS functionality.
- **Expand monitoring coverage:** The IHIS should expand beyond current gaps to include groundwater, surface water, springs, rivers, snow monitoring, and meteorological stations — feeding into early warning systems and predictive analytics.
- **Governance first:** Strengthening coordination mechanisms and institutional capacity at the ministry and establishment level was seen as foundational to IHIS sustainability.

On the Nature Based Solutions (NbS) for Wastewater treatment :
 Group 3 discussions on wastewater and NbS generated substantive feedback with a forward-looking orientation toward the Adaptation Fund (AF) as a potential complementary financing mechanism:

- **Strong interest in NbS approaches:** Participants affirmed the relevance of constructed wetlands, decentralized treatment systems, and nature-based wastewater solutions — particularly in rural and peri-urban contexts where conventional infrastructure is cost-prohibitive or governance-constrained. Akkar's dispersed settlement pattern makes it well suited for decentralized and NbS-based approaches.
- **Regulatory and social prerequisites:** Feedback highlighted that regulatory frameworks governing treated wastewater reuse and sludge management remain underdeveloped in Lebanon. Social acceptance challenges — particularly around treated water reuse for irrigation — must be addressed through awareness and third-party verification before scaling up.
- **Sludge management pathways:** Multiple reuse options were discussed (composting, fuel pellets, cement incorporation, solar drying, pyrolysis), but participants stressed that feasibility assessments and market analyses must precede any investment

			decisions. • Scaling decentralized systems: Participants recognized that pilot and demonstration sites in areas like Akkar could serve as proof-of-concept for NbS wastewater treatment at scale — an approach well aligned with AF's focus on replicable, community-level adaptation solutions. • AF as a complementary vehicle: The discussion implicitly acknowledged that GCF financing — oriented toward transformational, system-level change — may be better suited to the IHIS and large infrastructure components, while the Adaptation Fund, with its direct access modality and focus on local-level, community-driven adaptation, could be a more appropriate and agile vehicle for piloting NbS wastewater treatment in Akkar. This dual-track approach would allow the GCF concept note to remain focused and investable, while AF pursues the decentralized NbS demonstration work in parallel.
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