



Terms of Reference for IUCN Consultancy

Title: Flood management planning in Ras Baalbek and Qa'a, Lebanon – Climate change and socio-economic integration

Objective of the Consultancy

This consultancy has the following objective(s):

Integrate climate scenarios and socio-economic dimensions into a flood management planning activity, building on the completed scoping phase.

Background

Project Reference: P04155

About IUCN

IUCN is a membership Union uniquely composed of both government and civil society organizations. It provides public, private and non-governmental organizations with the knowledge and tools that enable human progress, economic development and nature conservation to take place together.

Created in 1948, IUCN is now the world's largest and most diverse environmental network, harnessing the knowledge, resources and reach of more than 1,400 Member organizations and around 15,000 experts. It is a leading provider of conservation data, assessments and analysis. Its broad membership enables IUCN to fill the role of incubator and trusted repository of best practices, tools and international standards.

IUCN provides a neutral space in which diverse stakeholders including governments, NGOs, scientists, businesses, local communities, indigenous peoples organizations and others can work together to forge and implement solutions to environmental challenges and achieve sustainable development.

Working with many partners and supporters, IUCN implements a large and diverse portfolio of conservation projects worldwide. Combining the latest science with the traditional knowledge of local communities, these projects work to reverse habitat loss, restore ecosystems and improve people's well-being.

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About the Project

IUCN, in partnership with the International Water Management Institute (IWMI), was awarded the MURUNAH project by the Foreign, Commonwealth & Development Office (FCDO). The project aims to increase water security in the MENA region by integrating Nature-Based Solutions for Water (NBSW) and Agricultural Water Management (AWM) to address climate change and land degradation. The program will strengthen and empower national capacities for implementing and upscaling integrated NBSW/AWM through a transformational change process, developing action-oriented field examples and recommendations to overcome technical and non-technical barriers. It will generate evidence of NBSW/AWM's contribution to increasing water security sustainably. To support the project's commitments, IUCN will hire a technical consultancy firm for the purpose of flood management planning particularly climate and socio-economic integration.

Description of the Assignment

Overview and work completed to date

The RNBWS pilot site in Lebanon is focused on flood management in the Baalbek basin (approximately 250 km²). This assignment is part of the Second and Third phases of a flood management planning process, and it builds on the completed scoping phase. Overall, the outputs of the first phase and information that will be shared by IUCN are:

- a.) **Hydrological and hydraulic models (HEC RAS & HEC HMS)**; those were developed to simulate flood events for different return periods, helping identify high-risk areas and immediate flood mitigation measures and locations.
- b.) **Hazard maps of the basin**
- c.) **Proposed immediate flood management measures – mapped out (hill lakes, vegetation cover, stone check dams, etc.)**
- d.) **Full designs of two flood management interventions**
- e.) **Climate change downscaling data (high resolution and bias-corrected)**

Assignment

The consultancy assignment covers the following **tasks**:

Task 1 – Refine existing **HEC RAS, HEC HMS models** of Ba'albek basin (250 km²) under two climate scenarios alongside **flood hazard maps**.

- Climate Change Projection Integration: Integrate downscaled climate change projection data (temperature and precipitation) for the project area.
- Model Calibration: After incorporating climate change projection data, update the HEC-HMS and HEC-RAS models to account for future rainfall and runoff scenarios. The model calibration should consider site-specific flood prone areas that are already identified, incorporating updated precipitation return levels under SSP2-4.5 and SSP5-8.5 scenarios.
- Flood Mapping under Climate Scenarios: Reassess flood-prone areas under future climate conditions
- Update flood hazard maps: Producing high-resolution flood hazard maps that explicitly delineate flood depths, velocities, pressure zones, and shear stresses, building on the

high-resolution flood model using high-resolution DEM (5 * 5 m) or better quality. This is to be purchased by the consultant.

Task 2 – Assess the impact of the already designed flood management interventions using a high-resolution DEM (5 * 5 m) or better quality. The designs and locations of these interventions will be shared by IUCN, and they include: 1) Gabion walls combined with cleaning of existing ponds 2) Gabion walls

Task 3 – Carry out socio-economic analysis, covering the following:

- Impact and Vulnerability Analysis: Review the impacts of flooding on local livelihoods, infrastructure (including housing), and services through analysis of past flood impact data and reporting. Identify socioeconomic vulnerabilities and potential displacement risks.
- Economic Feasibility: Conduct a cost-benefit analysis to evaluate the already designed flood management measures in terms of economic savings and avoided damages,

Task 4 – Conduct flood management planning dialogue with key stakeholders

The output of this task is stakeholder-derived recommendations on governance changes and processes to a.) Improved disaster preparedness, and b.) Enact noted changes. This should inform the development of the climate adaptation roadmap (Task 5).

The dialogue should consider three main aspects:

- Community Resilience: Views on the proposed interventions to improve the resilience of local communities.
- Governance Structures: Considering existing policy and institutional structures, identify barriers and propose changes to local governance and oversight of flood management and support ongoing adaptation to climate changes.
- Enabling environment: Improving the enabling environment for RNBWS as a tool for flood management

The consultant should plan and cover the logistics for conducting a 1-day in-person workshop in Beirut with invitees of up to 35 (including the project team) in full coordination with the country implementing partner in Lebanon. The dialogue workshop plan should be shared with IUCN ahead of reservations.

Task 5 – Develop climate change adaptation roadmap, based on the following:

- Prioritization of Measures: Use the results of analyses in Tasks 1-3 to prioritize immediate flood management measures based on their environmental, economic, and social returns. The prioritization criteria should be approved by IUCN.
- Long-Term Climate Adaptation considerations: the detailed roadmap should contribute to adapting to changing flood and drought risks, outlining short-, medium-, and long-term actions based on climate projections, considering the outputs of task 4. Besides, a specific section should shed light on droughts.
- Monitoring and Maintenance: Develop a long-term framework for monitoring flood control structures and maintaining adaptive measures, which is intended to support stakeholders to maintain them over time.

- The road map output should be in Word format (~20 pages) with a 1-2 page visual summary including pathways and their synergies.

Task 6 - Develop flood management training material targeting municipal engineers, planning authorities, and water establishment staff to build familiarity with the following topics: Flood modelling, social risk assessment, and sustainability planning of flood management interventions.

Duration of the Assignment

Four months from the effective date of the agreement

Deliverables and Activities

The Consultant will provide the following deliverables and carry out the following activities:

Deliverable/Activity	Description	Deadline
Deliverable 1	Inception report clarifying detailed working steps at the early stage of the consultancy	10 days from the signature date
Deliverable 2	Flood management training material	30 days from signature date
Deliverable 3	Environmental and socio-economic analysis report, including Impact and Vulnerability Analysis, and economic feasibility.	30 days from signature date
Deliverable 4	Dialogue workshop plan	30 days from signature
Deliverable 5	Dialogue workshop report including Climate Adaptation Roadmap outline	40 days from signature
Deliverable 6	Refined HEC-RAS, HEC-HMS models under climate scenarios, with a report explaining all refinement steps (Note: All source files and data must be shared with IUCN as part of this deliverable)	90 days from signature date
Deliverable 7	Refined Flood Hazard map under climate scenarios	90 days from signature date
Deliverable 8	All source files	100 days from signature date
Deliverable 9	Climate adaptation roadmap	100 days from signature

Payment Schedule

The Timetable below summarises the chronological order of deliverables and indicates milestones at which IUCN will pay the Consultant.

Deliverables	Milestone payment
• Deliverables 1, 2, 3, 4 and 5	50%
• Deliverables 6, 7, 8, and 9	50%

Expert qualification

To fully complete the tasks under this consultancy, the consultant's team should include a team of experts. This section outlines the main required experts, their minimum qualifications, and the needed level of effort (LOE) through the timeline of this consultancy (100 days).

<u>Expert qualifications</u>
1. <u>Project manager (LOE: 50 DAYS – distributed throughout the entire implementation period)</u> • Master's degree in water management or relevant specialization (PhD is an advantage). • Demonstrated expertise in the Lebanese water sector. • At least 12 years of experience in water management planning projects. • Experience in working with the local stakeholders of Lebanon within the water sector
2. <u>Hydrologist (LOE: 100 days)</u> • Master's degree in water management or relevant specialization (PhD is an advantage). • Demonstrated expertise in hydrological modelling. • Experience in working with the local stakeholders of Lebanon within the water sector. • At least 10 years of experience in water systems analysis. • Proficiency in hydrological analysis using HEC-RAS, HEC-HMS models.

Supervision and coordination

The Consultant will report to and work under the supervision of Water & Climate Change Programme team.