

Terms of Reference

Lead National Consultant (LNC) to support development of a project proposal for the Adaptation Fund addressing extreme climate-induced water-related events in Moldova

Duty Station: Chisinau, Moldova

Duration of Assignment: up-to 68 workdays (September 2019 – October 2020)

Contract Type: IC contract

BACKGROUND/OVERVIEW:

Republic of Moldova (Moldova) is a small-sized landlocked country in Eastern Europe, exposed to different natural hazards, including floods, droughts and severe storms. In line with climate scenarios, in Moldova the average temperature is expected to increase with 2-3° C, resulting in more acute weather patterns and increased the frequency and magnitude of floods and drought.

Climate change and water resources

Water resources in the Moldova are sensitive to climate change with regards to their quantity and quality. Various emission scenarios and climate models provide different projected values for future water quantity and quality in Moldova, however, they indicate the sign that expected changes will be negative in any case. The natural water regime of the big and small rivers will change by increasing in the instability of annual flow and magnitude of spring and flash floods.

In addition, climate modeling shows that drought will become longer and more severe. The major expected effects of the climate change on the Moldova's waters are i) decline of the average annual rainfall by 6.8% for the 2040-69 period and decline of summer and autumn precipitation by 19.3% and 16%, respectively; thus, the frequency and severity of drought, with the probability of catastrophic drought (less than 50% of mean rainfall) will increase from one event within nine years to one event within two years; ii) reduce of available water resources by two-thirds by the 2080s; iii) increase and severity of floods. The impacts of climate change are expected to intensify as changes in temperature and precipitation affect economic activity, social sphere and natural ecosystems. The socio-economic costs of climate related natural disasters such as droughts, floods are significant, and both their intensity and frequency are expected to further increase as a result of climate change.

Droughts impacts

The severe drought in 1994 resulted in a decline of 30% in GDP and 26% in agricultural output, while the 2007 drought with the estimated losses for the agricultural sector at about US\$1 billion reached 23% of the GDP of Moldova. On average, northern Moldova experiences a drought once every ten years, Central Moldova once every five to six years, and southern Moldova once every three to four years. From 2000 to 2012 the country has experienced 4 years (2000, 2003, 2007, and 2012) with the devastating droughts. Drought duration varies from a few days to several months or even years in a row (in fact, successively in 1945, 1946, and 1947).

Floods on big rivers

The two big rivers as Prut and Dniester flooding in 2008 and 2010 caused the greatest damage. The 2008 floods on Prut and Dniester Rivers incurred USD 120 million in losses while the 2010 floods - USD 41.92 million which are estimated to have had an adverse economic impact on GDP of about 0.15 percent. In 2008 about 40 villages were flooded, 500 houses were completely or partially under water, and 150 of them were almost completely destroyed.

About 8000 people were left homeless. 10,500 hectares of agricultural land were flooded. A third of the entire crop was lost. The damage was assessed as \$ 120 million; of them, 20% accounted for infrastructure, 15% - for farmland, and 65% - for real estate, houses, cottages, shops, camps and recreation centers, entertainment zones, sanatoriums, etc. In the 2010 the damage affected nearly 13,000 people, destroying critical infrastructure, washing away crops and livestock, damaging homes, and causing displacement. The 2010 floods highlight the importance of reducing disaster risks in RM, particularly as predictions indicate the country faces a greater likelihood of extreme temperature and precipitation patterns due to climate variability. The existing flood forecasting and early warning system in Moldova is another limiting factor for an effective flood risk management, which require strengthening at the technical, legislative and institutional levels.

Flash floods

Heavy rains result in frequent floods, to which over 40 percent of the country's settlements are exposed. On smaller rivers, heavy rains can form a flood within 2-3 hours, and location and magnitude of flood cannot be precisely determined. Flash floods are rather common in Moldova due to topographic and climatic conditions, and almost annually heavy rains result in local floods when the lands and settlements are inundated. The situation is aggravated by the fact that often, the reservoirs on the rivers are overflowing, and since many reservoir's dams are old and being in bad technical conditions, they often collapse what results in numerous materials and even human losses downstream. The flash floods occurring within small river basins provoke average annual damage estimated at the level of \$5 million. Despite these facts, the system for early detection and warning of flash (rapid) floods was not established in Moldova.

Flood defense infrastructure

Flood is seen as one of the major risks given that almost half of all Moldovan localities are situated in the flood-prone areas and additionally, around 45,000 ha (or 2% of agricultural lands) have a history of being waterlogged. During last decades the risk of floods has increased due to outdated and weak flood protection system mainly inherited from Soviet times. Generally, flood defense infrastructure in Moldova consists of dams and dykes on the Dniester and Prut Rivers, and on smaller rivers. These still provide protection against floods, but their technical condition is a matter of great concern. Currently, there exists no reliable information on number of dams, situated on the Moldova's small rivers. There exists no precise information on technical conditions of the flood control infrastructure, including reservoirs' dams and dykes along rivers. According to various sources, in Moldova, number of dams varies from 4,000 to 6,000. Many of them were built without design documentation and do not have passports; for majority of old dams the design documentation was lost. There are also gaps in legislation addressing land relations, use of land of water bodies, commissioning of hydro-technical infrastructure, etc. Within last time, there were carried out several inventories of dams, but this process is still in progress, and available information is fragmentary and incomplete. According to rough estimates, around 20% of dams constructed on small rivers are either broken or do not operate properly.

Moldova has extensive systems of dykes. There are about 60 systems of dykes with a total length of about 1,240 km that protect about 90,000 ha of land. Despite the Prut and Dniester Rivers' dykes are generally maintained in good conditions, in some places they show undulating longitudinal profile (a particular problem is that crest level has been locally lowered by up to 1.5 m as a result of their paths and tracks created by people and farm machinery crossing the banks); deep ruts, grooves or channels, that locally have a depth of typically 0.5 m; damage to the integrity of the structure of the banks by burrowing animals; in some sectors the bank profile (including level and width) is not maintained what can result in subsidence of the bank; in some sectors there is a dyke damage caused by erosion.

Hydrological monitoring network

The exclusive role in monitoring of meteorological and hydrological parameters lies with the State Hydro-meteorological Service. There exists a network of meteorological stations and gauges both on the big rivers Dniester and Prut, and on smaller ones. This network was established in 60s of the last century, and currently, does not meet requirements for the integrated management of water resources, including monitoring of climate change impacts on water courses.

Currently, there exists 12 meteorological stations and 22 meteorological/ agro-meteorological posts established in the Dniester river basin, and 6 stations and 10 posts in the Danube-Prut river basins. The network consists of both classical hydrological posts (where water level is measured by operators on a daily basis) and new water level monitoring stations equipped with automatic detectors and data loggers. Around 30 gauges are automatic ones. They were installed in the frameworks of several technical assistance projects mainly on the Dniester and Prut rivers, and very few - on smaller rivers. Currently, up to 50% of gauging stations are not in functioning due to different reasons (stolen, broken, no supplies and/ or poor maintenance). Thus, the hydrological data on smaller rivers and their tributaries are very limited.

Water dependent natural ecosystems

Currently, in Moldova, natural ecosystems are in very poor conditions. Forests cover only a small percentage of the country's territory, and they, with some exceptions, are unproductive and are semi-degraded. Remained wetlands are mainly found in the downstream of the Prut and Dniester Rivers. They are mainly small sized and not healthy being subject of anthropogenic and natural pressures and impacts. According to rough estimate, in Moldova, more than 75% of natural wetlands have been lost.

Small rivers are mainly straightened, deepened, and impounded; their floodplains are drained. Feeding water courses, where available, are often blocked by numerous dams. Large-scale changes of small rivers occurred in 50-70s of the last century in favor of agricultural activities on the drained floodplain lands. That time, the engineering paradigm for straightening and deepening the river channels was based on the requirement to let the flood wave pass as quickly as possible. As a result, natural river beds of many small rivers dramatically changed, and practically all natural barriers - meanders, rapids, backwaters, islands, riverine vegetation were removed. Better part of small rivers was turned into channel-type watercourses being exposed to extremely strong hydro-morphological alterations. In relation to the small river water flows, around 50% of the reservoirs built on them have fixed overflow weirs what means that downstream flow will only occur when the reservoir is full, thus the ecological flow downstream usually cannot be maintained properly. Thus, hydrological engineering, including drainage, land conversion and other human activities have affected the rivers and floodplains and resulted in severe degradation of river and wetland ecosystems in Moldova. Eventually, this pressure will be accelerated under conditions of climate change.

In addition, other factors contributing to increase of risks of natural hazards are the constant changes in land-use practices triggering soil erosion and ultimately leading to siltation of rivers and reservoirs, coupled with insufficient knowledge and capacities on ecosystem-based and non-structural approaches to the climate resilient flood and drought risk reduction.

Thus the **project objective** is to improve national and local resilience to extreme water-related events through promotion of sustainable integrated management of flood and drought risks. International expertise is required to support the project scoping, design the AF Concept and, consequently, develop the AF project Proposal based on thorough situation analysis and extensive stakeholder consultation. During the proposal preparation period, a number of studies and stakeholder consultations will be conducted with the view to further develop a fully formulated proposal. The final output of the international consultant's work will be the AF project Proposal addressing obtained feedback and ready for submission to the AF.

To support formulation of the Project Concept and Project Proposal, the UNDP Moldova has prepared a conceptual framework with indicative outcomes and activities listed below, but to be validated after the first in-country mission:

A. Strengthening of the early warning system for extreme water-related weather events at the national and local level and operational support capacity

- A1. Analysis and optimization of hydrological monitoring network towards the appropriate river basin water management and climate change paradigm.

- A2. Establishing of flash flood early detection and warning system
- A3. Improvement of understanding of local water governance institutions and their capacities for flood risk and drought management by better planning at the sub-basin level
- A4. Introduction of flood and hazards risks maps as an instrument for decision making under the climate change adaptation

B. Strengthening of the flood defense infrastructure

- B1. Inventory of dams and dykes in the central and south parts of Moldova to complete the Register of Hydro-technical Infrastructure
- B2. Dams and dykes safety surveys for identification of higher risks dams and its remediation.

C. Piloted and demonstrated ecosystems-based adaptation to climate change

- C1. Assessment of national potential to implement ecosystems-based climate change adaptation measures (national level)
- C2. Pilot projects for demonstration of ecosystems- based climate adaptation measures.

Against this background, UNDP is seeking a qualified candidate to assist developing of a full set of documentation according the AF formats and requirements.

OBJECTIVE OF THE ASSIGNMENT

The objective of this assignment is to develop under the leadership of an International Lead Consultant a Project Concept and detailed Project Proposal addressing extreme climate-induced water-related events in Moldova that would completely follow the AF requirements and reflect the draft conceptual framework developed by UNDP Moldova.

The main role/responsibilities of the national consultant is to (1) lead the national project development team; (2) lead and coordinate collection of the baseline information for the project development; (3) consolidate information inputs/reports from the national experts and communicate with the Lead International Consultant (4) liaise with the national and local partners, stakeholders and beneficiaries to develop and validate the proposal in a participatory manner.

OUTCOME OF THE ASSIGNMENT

The end result of the assignment will be a final version of the Project Concept and a developed in required details the AF Project Proposal addressing extreme climate-induced water-related events in Moldova submitted to the AF.

SCOPE OF WORK

This consultancy entails **68 workdays** and the task of the National Team Leader is to support development of the AF proposal, including of the Project Concept in AF format.

The National Team Leader will support the International Lead Consultant to develop a detailed project proposal package, including the proposal document in the required AF format, including all relevant analysis and studies, and all associated mandatory annexes for submission to AF and will be responsible for coordination with other consultant(s) as needed and ensuring overall quality of the proposal package.

The National Team Leader will be supported by an environmental expert to for Social and Environmental Screening Procedures of UNDP and AF and by a Gender Specialist who will develop the gender vulnerability assessment. Other technical experts might be hired as the preparation of the projects' proposal might evolve, and the National Team Leader will be tasked to produce the required TORs.

Under the overall guidance of UNDP Programme Specialists on Environment, Climate Change and Energy, UNDP CO and in coordination with the international and national consultants and as informed by guidance from the UNDP IRH Regional Technical Advisor, the National Team Leader (acting in his/her individual capacity) will be tasked with the following duties and responsibilities:

Coordination

- Coordinate the work of the national team (environmental and social assessment and gender experts, technical specialists etc) supporting the preparation of the project proposal for the AF and the required annexes;
- Liaise extensively with relevant national and local stakeholders and collect their views on the current situation, barriers and gaps and the way forward that the project proposal should be considering while being prepared;
- Together with the International Consultant scope the project preparation activities and work plan and ensure complementarity of the inputs and outputs of each consultant and identify the expertise that might be required in addition for this assignment and prepare the relevant TORs;
- Lead the stakeholder consultations process as well as the appraisal of the project proposal;

Design detailed proposal

a) Baseline work

- Together with the international consultant analyze the feasibility report available (i.e. EIB), analysis, researches etc providing baseline and justification for country's vulnerability to drought and flooding, that will serve as basis for development of the AF proposal.
- Identify the information gap and the additionally required expertise for the baseline analysis. Roadmap the collection of required socio-economic and environmental data, as well as in relation to the relevant national legislation, water and climate change and other information as required to complete the first sections of the AF proposal which entail baseline/background information (Project/Programme Background Context; Project/Programme Objectives; Project/Programme Components and Financing; Projected Calendar)
- Support the international consultant in establishing a strong climate change rationale for the proposed intervention based on the analysis of climate change trends, impacts and risks; justification of the climate-driven problem and adaptation solutions;
- As indicated by the international consultant provide inputs to the feasibility report which is supporting the design of the project addressing additionality, climate and non-climate drivers, gaps and needs, best practices and lessons learned and leading to detailed recommendations for the project including aspects related to sustainability, innovation, and knowledge management, etc. The report should include technical, institutional, and financial feasibility of the proposed project activities, and ensure that they increase adaptive capacity and reduce long-term climate change induced vulnerability.
- Support the international consultant in conducting a basic research of best practices available to feed into the feasibility report and project proposal – summarizing available global evidence on the efficiency of the proposed project strategy and pasture/water use technologies.
- Provide inputs to the Theory of Change (TOC)

b) Detailed Project Proposal

- In consultation with the international consultant and inputs from UNDP staff, support extensively development of the AF proposal aligned with the AF Guidelines for project development;
- Support in preparation of project monitoring and evaluation framework and logical framework with the set of SMART indicators;
- Ensure timely provision of inputs for completion of the proposal, facilitate communication and collection of data and information from the national team and support smooth submission of the project proposal to the AF;

- Address technical comments on the draft submission package.

DELIVERABLES AND TIME-TABLE

<i>Deliverable for the international consultant</i>
Deliverable 1: Inputs to the Inception Report of the International Consultant (4 days) including to the assignment approach and in-country mission planning (based on a desk review of the existing reports and coordination with UNDP CO)
Deliverable 2: Roadmap of information and data gap collection prepared, including TORs for the required expertise, (10 days) under the guidance of the international consultant
Deliverable 3: Missions of the international consultant prepared and meetings arranged with the national and local stakeholders (14 days) including liaising with the required actors and institutions for collection of inputs and baseline information for the TOC drafting
Deliverable 4: Inputs to the Final Feasibility Report (15 days) including support in collection of socio-economic and environmental data, as well as in relation to the relevant national legislation, water and climate change and other information as required to complete the first sections of the AF proposal which entail baseline/background information (Project/Programme Background Context; Project/Programme Objectives; Project/Programme Components and Financing; Projected Calendar); the respective deliverable to be completed with support from the national team
Deliverable 5: Inputs to the Draft AF proposal (15 days) with relevant supporting documents as annexes (with support from the relevant expert);
Deliverable 6: Consultation of the project proposal with relevant stakeholders (10 days) prior to the AF submission and afterwards and provision of support in addressing of the comments

The LNC will work on the time base contract, since September 2019 through October 2020. This will include 68 working days.

MONITORING

The monitoring of fulfillment of the assignment will be conducted by the LIC and UNDP Moldova Programme Specialist.

TRAVEL:

At the request of LIC and/ or IC, the LNC will have to organize the travel within the country and accompany LIC and IC. The cost of travel and accommodation, where needed, will be covered by the national consultant (to be included in the final financial offer)

SELECTION CRITERIA

REQUIRED SKILLS, EXPERIENCE AND TECHNICAL CAPABILITY

- University degree in water resources, environment, hydrology, water engineering or other fields related;
- At least seven (7) years of working experience in the field of the environment, natural resources, climate change projects and water management;
- Practical experience with projects socio-economic analysis and incremental cost analysis will be considered as an advantage;
- Experience with supporting development of climate change and water related projects and with managing teams;

- Practical experience with extensive consultation processes as part of project design and/or implementation and extensive liaising with various stakeholders;
- Experience with preparation and supporting implementation of internationally funded projects;
- Academic background in environment or related-field;
- Good ability in partnering and networking;
- Proficiency in English, good knowledge of written and/or spoken Russian, Romanian is an asset;
- Excellent interpersonal and cross-cultural communication skills;

TERMS AND CONDITIONS FOR PROVISION OF SERVICES

Selection criteria are shown in the Procurement Notice advertised together with this ToR.