REQUEST FOR EXPRESSIONS OF INTEREST
(CONSULTING SERVICES - INDIVIDUAL CONSULTANT)

Republic of Moldova
Strengthening Moldova's Disaster Risk Management and Resilience Project
Loan No:9720-MD

Assignment Title: Consulting services for technical assessment, options analysis, and development of integration solutions for snow depth measurement sensors into the automated meteorological station network of the Public Institution "Authority for Meteorology and Environmental Monitoring" (AMM)

Reference No. (as per Procurement Plan): MD-OEAPM-552712-CS-INDV

The Republic of Moldova has received financing from the World Bank toward the cost of the Strengthening Moldova's Disaster Risk Management and Resilience Project, and intends to apply part of the proceeds for consulting services.

The consulting services ("the Services") include *Consulting services for technical assessment, options analysis, and development of integration solutions for snow depth measurement sensors into the automated meteorological station network of the Public Institution "Authority for Meteorology and Environmental Monitoring" (AMM)*. The assignment is implemented under Component 2 "Improvement of Hydrometeorological Services" of the SMORE project.

The Terms of Reference (TOR) for the assignment are attached to this request for expressions of interest.

Public Institution "Authority for Meteorology and Environmental Monitoring" (AMM), through the Office for External Assistance Programs Management (OEAPM) / Project Implementation Unit of the Project, now invites eligible individual consultants ("Consultants") to indicate their interest in providing the Services. Interested Consultants should provide information demonstrating that they have the required qualifications and relevant experience to perform the Services.

The Consultant should meet the following minimum qualification requirements:

1. Higher education in meteorology, hydrology, engineering, environmental sciences, or related fields; postgraduate studies (Master's/PhD) are an advantage;
2. Minimum 7 years of relevant experience in working with automated meteorological stations or environmental monitoring systems;
3. Practical experience with Campbell Scientific systems (e.g., CR1000), SDI-12, RS-232, and Modbus protocols;
4. Experience in sensor integration into existing systems, data flow development, databases, and web platforms;
5. Familiarity with World Meteorological Organization (WMO) standards and recommendations;
6. Experience in projects funded by the World Bank, EU, or other international donors;
7. Ability to produce clear technical reports, cost-benefit analyses, and strategic recommendations.

The attention of interested Consultants is drawn to Section III, paragraphs 3.14, 3.16, and 3.17 of the World Bank Procurement Regulations for IPF Borrowers – Procurement in Investment Project Financing Goods, Works, Non-Consulting and Consulting Services, dated September 2023 (hereinafter referred to as "the Regulations"), setting forth the World Bank's policy on conflict of interest.

A Consultant will be selected in accordance with the Individual Consultant (IC) method set out in the World Bank Procurement Framework.

Further information can be obtained at the address below during office hours 08:30 to 17:30 local time.

The applications should include a letter of Expression of Interest, CV, and related recommendation letters.

Expressions of interest shall be submitted electronically to achizitii.proiecte@ogpae.gov.md before **17:30 local time, June 04, 2026**, with the following reference indicated in the **subject line: REOI – MD-OEAPM-552712-CS-INDV – Snow Depth Sensor Integration Consultant**.

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Loan Agreement No. 9720-MD/2025
Strengthening Disaster Risk Management and Climate Resilience Project in Moldova
(~~CMRDR~~SMORE, P504278)

Component 2
Improvement of Hydrometeorological Services

TERMS OF REFERENCE

Individual Consultant

Consulting services for technical assessment, options analysis, and development of integration solutions for snow depth measurement sensors into the automated meteorological station network of the Public Institution "Authority for Meteorology and Environmental Monitoring" (AMM)

PROJECT BACKGROUND AND OBJECTIVES

Background

1) The Government of the Republic of Moldova is implementing the Strengthening Disaster Risk Management and Climate Resilience Project (SMORE), financed by the World Bank. The project aims to strengthen the country's capacity to prevent, prepare for, and effectively respond to natural disasters and climate risks, as well as to ensure a prompt and coordinated response in the event of emergencies or relevant crises.

2) The Public Institution "Authority for Meteorology and Environmental Monitoring" (PI AMM), in collaboration with the Ministry of Environment, is implementing Component 2 "Improvement of Hydrometeorological Services" under the SMORE project. In 2025, the World Bank developed the strategic document "A Strengthened and Fit-for-Purpose Public Institution "Authority for Meteorology and Environmental Monitoring" (AMM) in Moldova: Roadmap", which highlights the main gaps, challenges, and opportunities in the observation infrastructure. This document provides strategic directions for strengthening AMM's capacity to deliver modern hydrometeorological services aimed at protecting lives and property, as well as supporting the country's sustainable socio-economic development.

3) Under Component 2 of the SMORE project, the AMM aims to modernize existing infrastructure, strengthen technical and operational capacities, and improve the processes for collecting, processing, and disseminating climate data and information. To achieve these objectives, it is necessary to contract specialized consulting services for the design and optimization of meteorological and hydrological observation infrastructure, in accordance with the recommendations and standards of the World Meteorological Organization (WMO).

4) The Public Institution "Authority for Meteorology and Environmental Monitoring" (PI AMM) of the Republic of Moldova is the national authority responsible for monitoring weather conditions, hydrological resources, and climate conditions, as well as for providing meteorological and hydrological information necessary for the protection of the population, the national economy, and the environment.

5) As part of an earlier phase of modernization of the national meteorological observation system, in 2015 an automated meteorological station network was implemented, installed by the

company ADASA. These stations are equipped with Campbell Scientific CR1000 dataloggers and ensure the automatic collection of basic meteorological data (temperature, humidity, wind, precipitation, etc.), significantly contributing to increased frequency and quality of observations.

6) However, in their current configuration, the stations are not equipped with sensors for measuring snow depth, a parameter essential for:
   - assessing water amount in the snowpack,
   - forecasting spring runoff and consequent floods,
   - monitoring hazardous meteorological phenomena,
   - supporting activities in agriculture, transport, and emergency management,
   - improving climate analyses and international reporting.

7) In the context of climate change and increasing variability of winter phenomena, the need for automated and continuous monitoring of snow cover is becoming increasingly important. The integration of modern sensors (ultrasonic or laser) into the existing network of automated meteorological stations represents an efficient solution for expanding observation capabilities without requiring major investments in new infrastructure.

8) At the same time, the existing network uses standardized data acquisition and transmission systems based on the CR1000 datalogger, which supports industrial protocols such as SDI-12 and RS-232, providing favourable conditions for the integration of new sensors. However, a detailed assessment of technical compatibility, hardware and software integration requirements, as well as the impact on existing systems is necessary.

9) Another important aspect is the integration of new data into the existing digital infrastructure, including the EcoData web application used for storing, visualizing, and processing meteorological data and also into planned new digital infrastructure. This involves adaptations at the level of databases, processing workflows, and visualization tools and ensuring that the output of the sensors is made available in WMO standard data formats.

10) In this context, the AMM intends to contract an international expert to carry out a comprehensive analysis of the available options and to propose optimal technical and economically sound solutions for modern snow depth measurement sensors (ultrasonic or laser) and their integration into the existing meteorological observation system.

11) External expertise is required to ensure:
   - alignment with international best practices and the standards of the World Meteorological Organization (WMO),
   - selection of the most suitable technologies available on the market,
   - minimization of technical and operational risks,
   - efficient use of financial resources.

The results of this assessment will form the basis for strategic decisions regarding the modernization of the observation network and will contribute to strengthening the institutional capacities of the AMM in the field of winter conditions monitoring.

Objective of the Assignment

The main task of the international expert will be to analyze and propose optimal technical and economic solutions for integrating snow depth measurement sensors into the existing automated meteorological stations and to alow for the future integration of the snow depth data into the planned new digital infrastructure.

- Assessment of Existing Infrastructure
  Analysis of the technical configuration of meteorological stations:
  - existing sensors and connections;
  - power supply sources (solar panels, batteries);
  - data acquisition via the CR1000 datalogger;
  - communication systems (GPRS/3G/LTE, as applicable).
- Assessment of Existing Software:
  - data acquisition programs (CRBasic);
  - data transmission workflows;
  - the EcoData web application.
- Identification of Compatible Sensors
  Identification and evaluation of sensor types:
  - ultrasonic sensors;
  - laser sensors.
- Evaluation of Compatibility with the CR1000 Datalogger
  - communication protocols (SDI-12, RS-232, RS-485);
  - power consumption;
- Hardware Integration
  Identification of:
  - cabling and interface requirements;
  - additional equipment (if applicable);
  - mounting solutions (height, support, alignment);

  Assessment of the impact on:
  - power consumption;
  - datalogger capacity.
- Software Integration
  Analysis of the possibility of:
  - modifying existing CR1000 programs;
  - including new parameters in the data flow;

  Assessment of compatibility with existing systems:
  - data formats;
  - transmission protocols.

  Identification of additional requirements:
  - software updates;
  - additional developments
  - compatibility with planned new digital infrastructure.
- Integration into the EcoData Web Application
  Assessment of the possibility of integrating new data into:
  - the database;
  - processing workflows;
  - the visualization interface.

  Proposal of:
  - visualization methods (graphs, alerts);
  - data validation and quality control procedures.

- 3.6 Cost Estimation
  The expert will provide detailed estimates for:
  - sensor procurement (alternative options);
  - installation and mounting;
  - hardware and software integration;
  - adaptation of the EcoData application;
  - staff training and maintenance.
- 3.7 Feasibility Analysis and Recommendations
  Assessment of:
  - technical feasibility;
  - operational sustainability;
  - cost-benefit ratio.
- Formulation of recommendations regarding:
  - optimal sensor types;
  - phased implementation (if applicable);
  - risks and mitigation measures.

RESULTS AND TERMS

The contract envisages a Level of Effort is **28 working days**, and should be executed within a total duration of 90 calendar days, with the possibility of extension depending on satisfactory performance and project needs. Cost estimates should include all necessary travel to AMM observation sites to assess the current equipment and to identify all issues related to the integration of snow depth sensors with the existing network.

All draft reports and final reports/studies/assessments will be submitted to the AMM project team for review and approval.

No	Deliverable	Required Days
1	Review of existing documents (SMORE, Roadmap, AWS technical documentation), establishment of methodology and work plan	3 days
2	Analysis of automated meteorological stations (hardware, CR1000, communications, power supply, existing software)	5 days
3	Identification and evaluation of compatible sensors (ultrasonic, laser), technical comparative analysis	4 days
4	Analysis of installation requirements, physical compatibility, energy consumption, interfaces	3 days
5	Analysis of integration into CR1000 (CRBasic), data flows, compatibility with existing software	3 days
6	Analysis of integration requirements for database, visualization, and processing	3 days
7	Cost estimation for equipment, integration, software development, training, maintenance; cost-benefit assessment, risks, implementation prioritization	3 days
8	Final Report summarizing all analyses, final drafting, and presentation	4 days
TOTAL		**28 days**

QUALIFICATIONS AND EXPERIENCE

No	Qualification Criteria	Maximum Score
1	Higher education in meteorology, hydrology, engineering, environmental sciences, or related fields; postgraduate studies (Master's/PhD) are an advantage	10
2	Minimum 7 years of relevant experience in working with automated meteorological stations or environmental monitoring	30
3	Practical experience with Campbell Scientific systems (e.g., CR1000), SDI-12, RS-232, Modbus protocols	15
4	Experience in sensor integration into existing systems, data flow development, databases, web platforms	20
5	Familiarity with World Meteorological Organization (WMO) standards and recommendations	10
6	Experience in projects funded by the World Bank, EU, or other international donors	5
7	Ability to produce clear technical reports, cost-benefit analyses, and strategic recommendations	10
TOTAL		**100**

Note: The Consultant shall perform the assignment in compliance with the requirements of the World Bank Environmental and Social Framework (ESF), ensuring that all activities are implemented in a manner consistent with the applicable Environmental and Social Standards (ESS), good international industry practice, and the applicable national environmental and social legislation and regulations.