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## TERMS OF REFERENCE

<b>Job title:</b>	<b>International Consultant in Meteorology to support strengthening and expansion of service delivery based on the WMO Strategy for Service Delivery</b>
<b>Type of Contract:</b>	Individual Contract (IC)
<b>Duty station:</b>	Home based
<b>Section/Unit:</b>	Environment, Energy and Climate Change Cluster
<b>Languages requirement:</b>	English
<b>Contract Duration:</b>	November 2020 – May 2021, 25 working days
<b>Payment arrangements:</b>	<b>Lump sum contract</b> (payments linked to satisfactory performance and delivery of outputs)
<b>Evaluation method:</b>	Interview of shortlisted candidates

### I. BACKGROUND

Climate change is already profoundly impacting the conditions for resource availability and agricultural activities. Over the last decade, the country has experienced a number of extreme events, such as droughts and major floods, along with the incremental effects caused by increased mean temperature, and the uneven distribution of precipitation through the year, which have had negative consequences on the country's economy, and its population wellbeing and health. Severe droughts are recurring more frequently causing significant economic losses. The increasing scope and intensity of extreme events has also resulted in increased frequencies of high-risk situations.

The Government sees the National Adaptation Planning (NAP) process as key to achieving the adaptation objectives outlined in its 2014 Climate Change Adaptation Strategy of the Republic of Moldova, and its 2020 Nationally Determined Contributions (NDC), as well as the continued mainstreaming of climate change considerations into its policies and budgeting processes. The proposed project supports the Government of the Republic of Moldova in advancing the second cycle of its National Adaptation Planning process (known as NAP-2). The outcomes of the NAP- 2 national adaptation planning processes, are:

- **Outcome 1:** To strengthen and operationalize the national steering mechanism for climate change adaptation (CCA);
- **Outcome 2:** To improve the long-term capacity on planning and implementation of adaptation actions through CCA technologies;
- **Outcome 3:** To improve the mainstreaming of climate change adaptation through the increased alignment of national development priorities, in the priority sectors (forestry, health, energy and transport).

The NAP-2 goals will be achieved within two parallel implementation tracks. The first track implemented by UNDP expands and deepens the national approach developed under the NAP-1 and strengthens synergies both vertically, at different levels of the governance, and horizontally, between the sectors affected by climate change to reduce duplication of efforts, pool scarce resources for effective use, and ensure a coherent and

comprehensive approach to the integration of CCA responses into development planning, while the second track will focus on adaptation in the agriculture sector and will be concurrently implemented under the auspices of FAO.

### **Meteorological observation network in the Republic of Moldova**

As Moldova braces for the impacts of climate change, timely and accurate weather information will be critical toward its efforts to prepare for and respond to the country's intensifying disaster risk as well as to support decision makers to mainstream adaptation measures into national and sectorial policies. This assignment will support the State Hydrometeorological Service (SHS), that is a part of the Ministry of Agriculture, Regional Development and the Environment. SHS is the main player in providing timely and accurate forecasts and warnings, however, modernization of meteorological observation networks shall be improved, and climate services extended.

Moldova's total land area is about 34,000 km<sup>2</sup> and the number of meteorological stations is close to the optimal density according to the meteorological standards. In 2016, the meteorological network was modernized. New automatic meteorological stations have been installed at 14 meteorological stations, which measure all the basic meteorological characteristics and the amount of precipitation. 13 out of 14 meteorological stations provide agrometeorological information. In 32 districts, less complex "mini AWS" automated meteorological stations have been installed, which measure a limited number of meteorological characteristics, in 2020 two more units were installed. AWS are measuring less parameters in comparison with the meteorological stations and observations limited to air temperature; air humidity; precipitation; soil temperature at depth.

In 2016 the agrometeorological network which consist of 15 agrometeorological posts was upgraded with new Delta-T2 sets for soil moisture determination. At agrometeorological stations a series of more complex observations are made such as soil moisture determination, height and amount of water in snow, storage of water in the ground, etc. Those observations are not carried out in all districts of the country that limits the possibility to provide targeted forecasts. Agrometeorological observations are used for crop yields forecasts, identification how meteorological conditions influence on various stages on crop development and are produced for 1-3 months' time horizon that can allow agricultural sector to adjust accordingly.

Meteorological observations are carried out in accordance with WMO standards and include over 80 meteorological variables, which are generated automatically or manually. Together they sum up the content of multipurpose meteorological data banks that are used to compile hydrometeorological forecasts to provide consumers with real-time information at observation points, to issue warnings and to characterize the weather and climate in three regions of the country.

Data from the meteorological stations is automatically send to the sever located in SHS premises in Chisinau, while further dissemination of information including warnings to the users in made manually by email or even by phone. The meteorological data is processed in line with WMO requirements by several software products, such as "PERSONA MIS", "PERSONA MIP" and „EcoData” (ADASA, Spain). Direct communication channel is used with application of UniMas (GISMeteo) software to obtaining data from the Regional Meteorological Center of WMO located in Moscow and as such compatibility of data is ensured.

Currently, SHS is not complying with WMO recommendations for recording SYNOP messages in BUFR that further must be shared with the Global Telecommunications System. There are several other areas where improvement of software is needed such as EcoDATA (ADASA) software for generation and transmission of decadal agrometeorological telegrams and GISMeteo software that serves for viewing, editing of meteorological data. Additionally, there is no software to support automatic forecast monitoring and mapping from 15 agrometeorological observations posts.

SHS maintains the National Hydrometeorological Data Fund, with observation records from 1886, with partial data digitalized. The climate database that is generated from meteorological observations contains the following parameters: air pressure, temperature, humidity, wind parameters, meteorological visibility, amount

of precipitation, cloudiness, soil surface temperature and depth, snow cover, atmospheric phenomena. Monthly data is generated automatically, and further is processed manually.

Meteorological network on the left bank of the river Nistru consists of 4 meteorological stations and only 1 agrometeorological station. These observation points are not part of the SHS, but the international exchange of operational information is carried out through SHS. Also, in accordance with the Cooperation Agreement between SHS and left bank territory Authorities, SHS receives monthly information for the creation of the digital meteorological database. SHS also shares data from the 4 nearest to the river meteorological stations to Transnistrian Hydrometeorological Centre.

In Moldova was also procured Meteorological radar DWSR-3501C with support of Disaster and Climate Risk Management Project. The radar yet is not fully functional as further update of software, calibration and increasing server capacities for data storage is required.

## **II. OBJECTIVES AND SCOPE OF THE ASSIGNMENT**

The main objective of this assignment is to execute a comprehensive review of existing meteorological observation network in the Republic of Moldova, assess its main functions and operational modality, the gaps and barriers and provide recommendations for improved climate-related services.

## **III. DUTIES AND RESPONSIBILITIES**

### **Summary of key functions:**

International Meteorology Consultant will be working in close cooperation with the National Meteorology Consultant to make comprehensive assessment of the meteorological network and provide a recommendation for its improvement. More specifically to:

- Undertake a review and assessment of the existing meteorological observation network according to the existing international requirements and relevant WMO guidelines;
- Review the coverage, physical conditions and rationale of the meteorological observation locations. Spatial locations, existing equipment, data flows should be addressed at the highest level of detail.
- Assess the current budget rationale allocated for the meteorological monitoring based on the data and calculations provided by the State Hydrometeorological Service;
- Guide the national expert on meteorology on the data collection and processing which is require for this assignment;
- Detailed assessment of data availability including transmission, processing and storage on local, national and international levels and provide recommendations on data flows improvement as well as Quality Control and Quality Assurance;
- Assess the modality and quality of meteorological forecasts and warnings and provide the recommendations for their improvement addressing national and international (including WMO) requirements;
- Recommend where appropriate to switch to up-to-date technologies (e.g. remote sensing), artificial intelligence for efficient operational processes;
- Design the requirements for an effective and optimized meteorological monitoring network for improved climate risk management, forecasting, and early warning systems;
- Assess together with the national expert the institutional arrangements for operation and maintenance of the meteorological observation network, and identify limitations such as management, capacity, planning, budget allocations, etc;

- Provide recommendations for improvement of the meteorological network including institutional, administrative and technical components. The recommendations should include situation analysis, assessment, recommendations and a roadmap of required actions;
- Conduct two online workshops to involve a wider range of stakeholders in the assessment of hydrological observation network and validate their visions and recommendations;
- Provide the recommendations for the development of the climate-related services that can be delivered as the result of modernization of the meteorological monitoring.

No.	Deliverables	Tentative timeframe/deadline
1	Detailed workplan for the implementation of assignment as well as outline of the Final Report	November 20, 2020 2 w.d.
2	Meteorological observation network assessed, and institutional operational capacities evaluated, and one online workshop organized	February 4, 2021 11 w.d.
3	Draft version of the Report on improvement of the observation network and institutional operational capacities to deliver user-oriented climate services send for consultation with key stakeholders and one online workshop organized	March 28, 2021 7 w.d.
4	Final Report on improvement of the meteorological observation network and institutional operational capacities to deliver user-oriented climate services approved by the SHS and UNDP	May 8, 2021 5 w.d.

This is a part-time consultancy. The timeframe for the work of consultant is planned for November 2020 – May 2021.

**Management arrangements:**

The consultant will work in close cooperation with the national expert on meteorology and team of consultants on hydrology, under the guidance of the National Team Leader and NAP 2 Project Manager. Implementation of the current assignment envisage a close cooperation with the State Hydrometeorological Service, that is responsible for hydrometeorological monitoring.

**Financial arrangements:**

Payments will be disbursed in several instalments, upon submission and approval of deliverables, and certification by UNDP Moldova Project Manager that the services have been satisfactorily performed.

**Confidentiality:**

Materials provided to the Individual Consultant and all the proceedings within the consultancy contract shall be regarded as confidential, both during and after the consultancy. Violation of confidentiality requirements may result in immediate termination of contract.

**IV. REQUIREMENTS FOR EXPERIENCE AND QUALIFICATION**

**Academic Qualification:**

- University degree in Meteorology, Environmental Science or other relevant area.

**Experience:**

- At least 7 years of progressively working experience in the area of meteorology including EWS;
- Knowledge of the design, installation and maintenance of meteorological operational monitoring equipment including remote sensing and data transmission technologies;
- Proven knowledge on international standards in the field of meteorological monitoring and data quality assurance;
- Knowledge of the country context and/or the region will be asset.

**Competencies:**

- Ability to work and coordinate teams remotely;
- Excellent facilitation and public presentation skills;
- Excellent and proven analytical and writing skills;
- Experience in the usage of specific data monitoring software and tools.

**Language requirements:**

- Fluency in English is required for this assignment.
- Knowledge of Romanian or Russian will be considered as an advantage for the candidate.

**V. PAYMENT MODALITIES**

The consultant's payment will be lump sum amount based, disbursed in instalments upon satisfactory performance and approval of deliverables.

**VI. APPLICATION PROCESS**

Applicants shall submit the following **required documents**:

- CV, including information about past experience in similar assignments and contact details for at least 3 referees;
- Brief description of why the individual considers him/herself as the most suitable for the assignment;
- Offeror's Letter confirming Interest and Availability with financial proposal (in USD, specifying the total lump sum amount). Financial proposal template prepared in compliance with the template in Annex 2.

**Incomplete applications will not be considered.**

If an applicant is employed by an organization/company/institution, and he/she expects his/her employer to charge a management fee in the process of releasing him/her to UNDP under Reimbursable Loan Agreement (RLA), the applicant must indicate at this point, and ensure that all such costs are duly incorporated in the financial proposal submitted to UNDP.

**VII. ANNEXES TO THE TOR**

Annex 1- Individual Consultant General Terms and Conditions

Annex 2- Offeror's letter confirming interest and availability, including financial proposal (template).