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Government of the People's Republic of Bangladesh
Agro-Meteorological Information Systems Development Project
Component-C of BWCSR
Department of Agricultural Extension
Khamarbari, Farmgate, Dhaka-1215

Request For Expressions of Interest
(Consulting Services – Firm Selection)

Developing sub-seasonal to seasonal forecasts and associated climate information for agricultural decision-making on
“Agro-Meteorological Information Systems Development Project” (Component C of Bangladesh Weather and
Climate Services Regional Project) (Contract Package No.: AMISDP-SD-010)

Memo: 12.01.0000.018.01.001.21.6372

Date: 19.12.2021

The People's Republic of Bangladesh has received a credit in the amount of USD 113million as from the International Development Association (IDA) towards the cost of Agro-Meteorological Information Systems Development Project [Component –C of Bangladesh Weather and Climate Services Regional Project (BWCSR)] to be implemented by Department of Agricultural Extension (DAE) and it intends to apply part of the proceeds to payments for the provision of consultancy services for the project by hiring of an International Agro-Meteorological Services Consultant.

2. Scope of Task /Service:

The services, among others, include the following:

Develop and support BMD to implement cutting-edge sub-seasonal and seasonal forecasts of rainfall, temperature and other meteorological variables relevant to agricultural planning and decision-making processes, following evaluation of product skill. Given evidence that the predictability of the climate of Bangladesh at seasonal and sub-seasonal timescales is limited, it will be essential for the selected firm to make use of international best practices for objective, reproducible forecast methodologies that take advantage of the latest state-of-the-art dynamical model predictions available. The forecasts should be developed based on sub-seasonal dynamical model forecasts, calibrated against gridded data fields from BMD. They should include calibrated forecasts of rainfall, temperature and other relevant meteorological variables (depending upon the availability of suitable observational data) issued in real-time, up to one month in advance. It is required to develop framework of skillful operational calibrated dynamical sub-seasonal to seasonal forecast, customized products integrating the forecast and historical, gridded rainfall, temperature and other relevant parameters, different agromet products for drought, flood monitoring, degree days etc.related to agriculture for preparation and dissemination of agromet advisories through BAMIS Portal developed under the Bangladesh Agrometeorological Information Systems Development Project'. Also, Standard Operating Procedure (SOP) document co-developed with BMD and DAE, and capacity building training to transfer new technology and capacity to DAE staff.

The selected consulting firm will work in collaboration with BMD and local agrometeorological experts to develop climate information products like products related to drought (SPI, SPEI, aridity anomaly index), flood, dynamic crop weather calendar, dynamic pest & disease calendar, degree days, different anomalies tailored to the needs of DAE and its stakeholders, using the firm's cutting-edge forecasting approach. This will involve the development and implementation of automated forecasting systems and of online interactive tools to display and disseminate forecasts and other information products, as well as the development of standard procedures to operationalize, operate and maintain the systems in real-time and beyond the life of the project.

Integrate relevant localized climate information products from BMD into existing and new agricultural advisories, and into the BAMIS portal. The selected consulting firm will support DAE to identify and integrate dynamical operational skillful seasonal-to-sub-seasonal forecasts, and other relevant gridded weather and climate information products and analyses available from BMD such as newly generated merged datasets of quality-controlled stations and satellite data (e.g., ENACTS) that may be useful to inform weather-sensitive agricultural management decisions. They will guide their integration into advisories and explore opportunities to develop new advisories that match the increased lead-time of seasonal and sub-seasonal forecasts. The selected firm will support the integration of newly developed products and datasets into the Bangladesh Agrometeorological Information Portal, in order to disseminate agrometeorological services and related information to the different users, especially to the farmers, in Bangladesh.

Assess the usability of new climate information products and advisories for local agricultural decision-making and for national planning and disaster risk-reduction. The selected firm will propose a process based on years of experience in use of climate services for agricultural decision-making to assess the usefulness and usability of advisory products developed from the perspective of farmers and other decision-makers, and analyze and share the results with DAE.

Transfer the developed technology to DAE staff, and strengthen DAE capacity to generate, access, communicate and use new climate information products and advisories, through training and development of an appropriate SOP (Standard Operating Procedure). The selected consulting firm should share end-to-end solution through training and obliging the SOP. The ultimate aim would be to maintain and use the system independently after the expiry of the project by the Consulting Firm. The selected firm will work with DAE to understand their capacity needs, and provide training for up to at least ten DAE staff on generating, communicating and supporting the use of new climate information and advisory products. At least

two kinds of training i.e., system management and use of system to generate and develop forecast products and training to communicate results and share with farmers should be provided by the consulting firm.

It will identify and work with focal points from DAE and BMD to develop a SOP manual covering accessing BMD products, integration of BMD products into relevant agricultural advisories, and integration of climate information products and advisories into the BAMIS portal.

Continued technical support following completion of the project. The selected firm and its local partner will provide technical support as needed, on a fee basis, for troubleshooting, maintenance and enhancement of the systems at DAE and BMD.

3. Department of Agricultural Extension (DAE) now invites eligible consulting firms ("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 short-listing criteria are:

- (a) General experience of the Firm(s);
- (b) Experience in similar assignments of compatible size, complexity and technical specialty in the required area;
- (c) Financial soundness of the firm; and staffing and logistics of the firm.

Consultants are requested to submit the following supporting documents in support of the above-mentioned criteria:

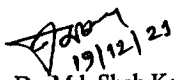
(a) Registration paper of the firm (s); (b) JV agreement/letter of intent (if applicable); (c) Firm's brochure; (d) Audited financial reports for last three years including top sheet; (e) service experience record (including nature, total cost, total input in terms of man month, employer, location of service etc.).

4. Consultants may associate to enhance their qualification, but should mention whether the association is in the form of a "joint-venture" or of "sub-consultancy". In the case of an association, all members of such "association" should have real and well-defined inputs to the assignment and in such "association" it is preferable to limit the total number of firms including the associates to a maximum of three (03).

5. The consultant will be selected in accordance with the Quality and Cost Based Selection (QCBS), ICB method set out in the World Bank's Guidelines: Selection and Employment of Consultants under IBRD Loans and IDA Credits & Grants by World Bank Borrowers, January 2011 (Revised July 2014).

6. Terms of Reference (ToR) will be available in the office of the undersigned and also in the DAE's website (www.dae.gov.bd/site/view/tenders/tender-EOI-job-circular and <https://www.bamis.gov.bd/en/page/tender/>). Interested consultant may obtain further information from the office of the undersigned from 09:00 to 17:00 hours (Except holidays).

7. Expression of Interest (both hard and soft copy) must be delivered to the address below (in person or by mail or by email) by 16:00 hours (GMT+ 6 hours) on or before February 24, 2022. The authority reserves the right to accept or reject any or all EOIs without assigning any reason, whatsoever.


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Terms of Reference (ToR)
For Hiring a Consulting Firm
for

Developing sub-seasonal to seasonal forecasts and associated climate information for agricultural decision-making, Package No: AMISDP-SD-010

Assignment Duration	: 18 Months
Assignment location	: Country-wide
Funding source (s)	: IDA, World Bank
Contracting entity	: Project Director, Agro-Meteorological Information Systems Development Project' (Component-C of "Bangladesh Weather and Climate Services Regional Project"), Department of Agricultural Extension, Khamarbari, Dhaka.
Method	: QCBS, ICB

1. Background

As part of the Agrometeorological Information Systems Development Project (AMISDP), Component C: Bangladesh Weather Climate and Services Regional Project, funded by the World Bank, the consulting firm will support the development of improved Agrometeorological Services to farmers of Bangladesh in order to sustain and increase agricultural productivity and assist them in coping with weather and climate extremes. The goal is to ensure the development of agromet-advisories that are informed by the best available science including historical information and state-of-the-art forecasts at sub-seasonal and seasonal timescales, contributing to provide the agricultural sector with a decision support information system to mitigate climate-related agricultural production risks.

2. Objectives

- Develop a framework for developing and integrating improved (skilled) sub-seasonal and seasonal forecasts, and of gridded historical and real-time data analyses, into agromet-advisories to improve their quality and impact on farm level planning;

This involves two sets of activities, including:

Supporting BMD-DAE team in >>>>

Develop and support BMD in implementing accurate, calibrated sub-seasonal and seasonal climate and forecasts products for rainfall, temperature and other meteorological variables relevant to agricultural planning and decision-making processes, and evaluate sub-seasonal to seasonal skill. Calibration of weather forecast be made based on the gridded and the existing network of weather observatories in Bangladesh. This is required for generating skillful weather forecast.

Support BMD in developing operational, web-based climate information products and tools tailored to the needs of DAE and its stakeholders.

Supporting DAE in >>>>

- Integrating relevant localized climate information products from BMD into existing and new agricultural advisories, and into the BAMIS portal.
- Assessing the usability of new climate information products and advisories for local agricultural decision-making and for national planning and disaster risk-reduction;
- Developing a Standard Operating Procedure (SOP) and training of DAE staff to undertake these tasks (of integrating the forecasts into agromet products and services), while also building their capacity of to access, understand, communicate and use new weather and climate information products from national, regional and global systems.
- Identify the needs for monitoring, maintenance, troubleshooting, and upgradation of the developed system to ensure long-term sustainability.

3. Scope of Work

Develop and support BMD to implement cutting-edge sub-seasonal and seasonal forecasts of rainfall, temperature and other meteorological variables relevant to agricultural planning and decision-making processes, following evaluation of product skill. Given evidence that the predictability of the climate of Bangladesh at seasonal and sub-seasonal timescales is limited, it will be essential for the selected firm to make use of international best practices for objective, reproducible forecast methodologies that take advantage of the latest state-of-the-art dynamical model predictions available. The forecasts should be developed based on sub-seasonal dynamical model forecasts, calibrated against gridded data fields from BMD. They should include calibrated forecasts of rainfall, temperature and other relevant meteorological variables (depending upon the availability of suitable observational data) issued in real-time, up to one month in advance. It is required to develop framework of skillful operational calibrated dynamical sub-seasonal to seasonal forecast, customized products integrating the forecast and historical, gridded rainfall, temperature and other relevant parameters, different agromet products for drought, flood monitoring, degree days etc. related to agriculture for preparation and dissemination of agromet advisories through BAMIS Portal developed under the Bangladesh Agrometeorological Information Systems Development Project'. Also, Standard Operating Procedure (SOP) document co-developed with BMD and DAE, and capacity building training to transfer new technology and capacity to DAE staff.

The selected consulting firm will work in collaboration with BMD and local agrometeorological experts to develop climate information products like products related to drought (SPI, SPEI, aridity anomaly index), flood, dynamic crop weather calendar, dynamic pest & disease calendar, degree days, different anomalies tailored to the needs of DAE and its stakeholders, using the firm's cutting-edge forecasting approach. This will involve the development and implementation of automated forecasting systems and of online interactive tools to display and disseminate forecasts and other information products, as well as the development of standard procedures to operationalize, operate and maintain the systems in real-time and beyond the life of the project.

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Assess the usability of new climate information products and advisories for local agricultural decision-making and for national planning and disaster risk-reduction. The selected firm will propose a process based on years of experience in use of climate services for agricultural decision-making to assess the usefulness and usability of advisory products developed from the perspective of farmers and other decision-makers, and analyze and share the results with DAE.

Transfer the developed technology to DAE staff, and strengthen DAE capacity to generate, access, communicate and use new climate information products and advisories, through training and development of an appropriate SOP (Standard Operating Procedure). The selected consulting firm should share end-to-end solution through training and obliging the SOP. The ultimate aim would be to maintain and use the system independently after the expiry of the project by the Consulting Firm. The selected firm will work with DAE to understand their capacity needs, and provide training for up to at least ten DAE staff on generating, communicating and supporting the use of new climate information and advisory products. At least two kinds of training i.e., system management and use of system to generate and develop forecast products and training to communicate results and share with farmers should be provided by the consulting firm.

It will identify and work with focal points from DAE and BMD to develop a SOP manual covering accessing BMD products, integration of BMD products into relevant agricultural advisories, and integration of climate information products and advisories into the BAMIS portal.

Continued technical support following completion of the project. The selected firm and its local partner will provide technical support as needed, on a fee basis, for troubleshooting, maintenance and enhancement of the systems at DAE and BMD.

6. Technical Approach and Methodology

The consulting firm should explain/describe its understanding of the objectives of the assignment, approach to the services, methodology for carrying out the activities and obtaining the expected output, outcomes and the degree of detail of such outcome. The proposed work should be based on the firm's own state-of-the-art products and methods, and the firm should be able to demonstrate its unique expertise in the field. The firm should highlight the problems being addressed and its importance and explain the technical approach that would adopt to tackle them. The firm should also explain the methodologies that it proposes or adopts and highlight the compatibility of those methodologies with the proposed approach.

7. Deliverables and timeline

The main outcome of the project will be the generation of agromet advisories that integrate historical analyses, skillful sub-seasonal and seasonal forecasts to improve the resilience of agriculture systems.

The outputs will include:

- The development of a validated, operational system for BMD to generate localized sub-seasonal and seasonal forecasts, using cutting-edge models and methodologies and gridded datasets such as BMD's ENACTS;
- The development of operational climate information products and Map room tools tailored to the needs of DAE;
- A suite of improved and new agricultural advisory designs and prototypes that incorporate BMD gridded forecast and historical climate products;
- Integration of new products and datasets to the BAMIS portal;
- Standard Operating Procedure document co-developed with BMD and DAE, and capacity building training to transfer new technology and capacity to DAE staff;

Deliverable	Date
Validated, documented system for BMD to generate and tailor localized sub-seasonal and seasonal forecasts to needs of agriculture	June 2022
Agricultural advisory co-design workshop and report	July 2022
Documented suite of prototype agricultural advisories that incorporate BMD gridded, online forecast and historical climate information products	September 2022
Updated BAMIS portal integrating new and enhanced DAE advisory products, and BMD gridded weather and climate products	March 2023
Standard Operating Procedure (SOP) on the generation of enhanced and new agromet advisory products	June 2023
Training workshop and report including training materials, both hard & soft copy, including video (youtube) for selected DAE staff on the generation and use of enhanced and new agro advisory products	September 2023
Agro advisory usability assessment report	December 2023

8. Duration of Services and Reporting

Total Study period will be considered for 18 months. The tentative reporting schedule for the consultant's assignment is given below:

Reports	Planned Time
Inception Report: 02 copies	At the end of 1st month of contract signing
First quarterly progress report: 02 copies	During 3rd month
Second quarterly progress report: 02 copies	During 6th month
Third quarterly progress report: 02 copies	During 9th month
Fourth quarterly progress report: 02 copies	During 12th month
Fifth quarterly progress report: 02 copies	During 15th month
Sixth quarterly progress report: 02 copies	During 16th month
Draft final report: 02 copies	At the end of 17th month of contract signing
Final report: 5 copies	At the end of this study.

9. Selection Method

The consultant shall be selected following Quality and Cost Based Selection (QCBS) based selection method set forth in Guidelines: Selection and Employment of Consultants under IBRD Loans and IDA Credits & Grants by World Bank Borrowers, January 2011 (Revised July 2014) on the basis of consultant's qualification, experiences and capability to carry out the assignment.

10. Key Personnel and Qualifications

a) Key Personnel

The firm may propose the structure and composition of its team members, listing the main disciplines of the assignment, the key experts responsible, and proposed technical and support staff. Considering the current pandemic situation, scientists from foreign countries may not be able to come to Bangladesh. Therefore, scientists from foreign countries may perform part the assigned work from home and part from offices in Bangladesh. The expected team profile is presented in Table 1.

Table 1: Proposed Team Composition (Key and non-key Experts)

Designation	Number	Total Person-Months	Type	Location
Key Experts - International				
Team Leader	1	18	Continuous	International
Senior Agriculture Specialist	1	16	Continuous	International
Statistical Climatologist	1	14	Continuous	International
Climate Data Specialist	1	18	Continuous	International
Agrometeorological Advisory Post-Doctoral Scientist	1	16	Continuous	International
Key Experts - National				
Senior Agronomist	1	16	Continuous	National

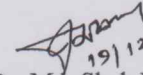
GIS and Data Scientist	1	16	Continuous	National
Non-Key Experts				
Junior Participatory Action Research facilitator	1	16	Intermittent	National
Project Associate	1	16	Continuous	National
Total	9			

b). The Qualifications of the Proposed Team

Table 2: Qualification and Experiences of Key and non-key Experts

Sl. No.	Position	Qualifications	Experience
1.	Team Leader (International)	Ph.D. in a field relevant to climate services	20 years of working experience on numerical weather prediction in different spatial and temporal scale, including at least 8 years of working experiences on leading projects related to weather forecasting and its application to user sectors and programs focused on developing countries
2.	Senior Agriculture Specialist (International)	Ph.D. in a relevant field of Agriculture	15 years of working experience on application of climate information and prediction on crops and livestock s, including at least 8 years of working experiences on leading projects and programs focused on developing countries
3.	Statistical Climatologist	Ph.D. in Statistics or related field	10 years' experience developing and evaluating statistical methods for developing and evaluating seasonal and sub-seasonal forecasts
4.	Climate Data Specialist	Master's degree in Atmospheric Sciences or related field	5 years' experience in meteorological data management, quality control, merging; NMHS capacity development
5.	Agrometeorological Advisory Post-doctoral Scientist	Ph.D. in a relevant field of Agriculture	2 years practical and/or research experience developing and evaluating farm management advisories based on weather and climate information
6.	Senior Agronomist (National)	Ph.D. in a relevant field of Agriculture	15 years of working experience on agriculture, agricultural planning, agricultural project implementation and management including at least 8 years of working experience on agricultural technology transfer and extension services in the field level of Bangladesh.

7.	National GIS and Data Scientist	Master's degree in field relevant to climate services	5 years of experience in programming and data science
8.	Junior Participatory Action Research facilitator	Master's degree in field relevant to climate services	8 years of experience in participatory action research on climate change, climate services and associated fields including several years of experience in Bangladesh.
9.	Project Associate	Masters of Arts or in a field relevant to climate services	5 years of experience in participatory action research on climate change, climate services and associated fields, including several years of experience in Bangladesh.


19/12/21

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