

TERMS OF REFERENCE (TOR)

Development of Meteorological and hydrological Services/modules, and integration with Centralized Database system

GENERAL INFORMATION

Services/Work Description:	Development of Meteorological and hydrological Services/modules, and integration with Centralized Database system
Project/Program Title:	Preparation of a National Adaptation Plan (NAP) for Bhutan, with a focus on the water sector
Type of the Contract:	Institutional Contract/Contract for Professional Services
Duration:	June to Second week of December 2022
Expected Start Date:	Second week of June 2022

I. BACKGROUND

Climate change is influenced by a wide range of complex interactions occurring over time in the earth systems of atmosphere, hydrosphere, lithosphere, biosphere, and cryosphere among others. Climate change impacts and adaptation studies require an earth system approach. A Climate Database Management System (CDMS) is a prerequisite for the chain of activities from field observation to data analysis and generation of hydro-met information and services.

The Royal Government of Bhutan created the National Center for Hydrology and Meteorology (NCHM) as an autonomous technical and scientific agency of the Royal Government of Bhutan in 2016 for generation of data and services related to hydrology, meteorology and cryosphere to support climate resilient development. Further the Climate Change Policy of the Kingdom of Bhutan (2020) mandates NCHM to be the national source of hydro-met data, services and advice to meet the needs of the general public, emergency services and other specialized users and to provide hydro-met data and information, climate projections and other early warning services.

The national hydro-meteorological network has over 400 hydro-met stations located across the country. Of which 197 are meteorological observation stations and 176 hydrological stations including both automatic and manual stations. The Center also maintains and operates 20 snow monitoring stations and 15 Glacial Lake Outburst Flood (GLOF) Early Warning System (EWS) stations along the different river basins. Most of the manual Hydro-met network stations were established in 1990's as a part of Bhutan Power System Master Plan (PSMP) project with the

support of UNDP and the World Bank (1990-1993). Similarly, modernization of the Hydro-met network with Automatic Weather Station (AWS) and Automatic Water Level Station (AWLS) was supported by the NAPA-II project financed by GEF-LDCF and technically supported by the UNDP. GLOF EWS systems in the Punatsangchhu basin were supported through UNDP/GEF LDCF (2008-2013) and Mangdechhu/Chamkharchhu basin supported by JICA (2013-2016).

Over the years, NCHM accumulated several standalone applications and database systems developed through different projects that have served the specific purpose of hydro-met data observation, monitoring and early warning. However, several challenges were faced by the Center. There were multiple standalone database systems with different data formats not compatible with each other. There was no Integrated Climate Database Management System to bring the data from monitoring stations and different systems to a common system for data processing, analysis and archival which affected effective service delivery.

II. OBJECTIVE OF THE ASSIGNMENT

The key objectives of this assignment are:

1. Assessment of ICT infrastructure and System roadmap at NCHM;
2. Development of web based hydrological and meteorological services (modules) as specified and integrate with existing central database system;
3. Installation of modules and integration of other systems with central database;
4. Training of NCHM officials on system administration; and
5. User training.

III. KEY TASKS OF THE ASSIGNMENT

The assigned firm will deliver services defined under the eight different tasks in this Terms of Reference (ToR). Modules covering Task 1 to Task 5 should be built on the existing Central Database System and be interoperable with the existing services in the Central Database. In addition to the task specified, the firm should deliver all the Key Deliverables specified in **Section IV**.

Task 1: Manual data entry interface for data sent from field

For the manual data entry, a specialized easy-to use Data Entry application for Android and iOS mobile phones and tablets to be developed. This Data Entry application should allow an observer or any trained volunteer person to enter the hydro meteorological parameters manually and together with the manually entered value it should take accurate date, time and location. The application should have the ability to work in offline mode, so that the observer can record data without immediate network connection. The recorded value should be temporarily stored in the mobile phone storage and automatically uploaded to the central server as soon as the network connection is available. The application should upload data over Wi-Fi connection or 3G/4G/5G or similar network connection. The Data Entry application should use a secure way to identify itself to the server as well as to upload the data to the server. Secured protocol should ensure that no malicious person can send to the server.

Following are the details:

Requirement	Form 1: Hydrology
Functions	<ul style="list-style-type: none"> ● Manual data entry interface for all data sent from all types of hydrological stations ● Mobile application to send data from the fields with location of the sender.
Input	<ul style="list-style-type: none"> ● Provision for Manual data entry sent from field (date, time, location and hydrological parameters) ● Provision for updating and storing cross sections to generate rating curves, rating table and flow with validity date.
Output	<ul style="list-style-type: none"> ● Basic Quality checks - limits, trends with email notification on errors, correction mechanism and audit trails. ● Auto filling/ missing interpolation data ● Water levels ● Discharge using rating curve ● Basic Statistics; 5-no summary (max, min, 3Qs) ● Advanced Statistics: Standard deviation- coefficient of variation- monthly, daily, annual, hourly ● Viewer- graphical and tabular result- both options required. ● Data download ● Meta data with map view

Requirement	Form 2: Sediment
Functions	<ul style="list-style-type: none"> ● Manual Sediment data entry
Input	<ul style="list-style-type: none"> ● Sediment data entry manually with date and locations
Output	<ul style="list-style-type: none"> ● Quality checks - limits, trends with email notification on errors, correction mechanism and audit trails. ● Basic Sediment Statistics; 5-no summary (max, min, 3Qs) ● PPM report for sediment data by basin or stations ● Data download ● Meta data with map view

Requirement	Form 3: Meteorology
Functions	<ul style="list-style-type: none"> ● Manual data entry interface for all data sent from all types of meteorological stations ● Mobile application to send data from the fields with location of the sender.
Input	<ul style="list-style-type: none"> ● Provision for Manual data entry sent from field (date, time, location and weather parameters)

Output	<ul style="list-style-type: none"> • Quality checks - limits, trends with email notification on errors, correction mechanism and audit trails. • Auto filling/ missing interpolation data • Weather parameters • Basic Statistics; 5-no summary (max, min, 3Qs) • Advanced Statistics reports/summary for all the available meteorological parameters; Standard deviation, max, min, coefficient of variation on an annual, monthly, daily basis. • Meta data with map view
---------------	---

Task 2: Upper air data

The center has an upper air data collection. This data needs to be integrated into the central server with necessary Quality Control modules. The graphical visualization of these data needs to be developed. An API is also required for data input and sharing of the data. It also needs to be integrated with SmartMet.

The module should be able to perform upper air analysis with Numerical Weather Prediction (NWP) integration.

Task 3: Weather forecast and warnings

The Center runs a Weather Research and Forecasting (WRF) model for weather forecasting. This component should involve integration of WRF model outputs and other global NWP products. It should also include metogram analysis tools. It should also be able to integrate SmartMet products. It should be able to post-process the model output with observation and generate warnings/advisories. The output should be displayed on maps in layers.

Functions name	Weather Forecasts
Input	<ul style="list-style-type: none"> • NWP data and products (WRF, Satellite, GFS, GEM, ECMWRF, etc.) • Output from Smart-met Weather Forecast

Output	<p>Seasonal forecasting</p> <ul style="list-style-type: none"> ● The module should be able to upload and display seasonal forecast products in a format such as shape files, JPEG, PNG and tables in the centralized system ● The module should have a user input functionality to input tables and values in the format provided by NCHM <p>Medium range forecasting</p> <ul style="list-style-type: none"> ● This module should be able to fetch long range forecasting outputs to central database ● The model should be able to perform basic MOS applications ● The module should be able to view and edit forecast data ● The forecast data will be in grib format ● The module should be able to compare forecast data with WRF data both graphically and in tabular format ● The module should include basic forecast verification tools <p>Verification of forecast</p> <ul style="list-style-type: none"> ● The module should be able to compare WRF outputs and observed station data ● The module should display graphs and tables of comparison at stations ● The model should be able to compute verification scores of temperature and rainfall ● The model should be able to perform both quantitative and qualitative verification scores wherever appropriate <p>Monsoon monitoring</p> <ul style="list-style-type: none"> ● the module should provide near real time update of large scale systems in the region ● The module should able to track and monitor large fronts such as monsoon and other tropical systems ● The module should provide a graphical display of these large fronts and issue warnings <p>Others</p> <ul style="list-style-type: none"> ● Quality checks - limits, trends with email notification on errors, correction mechanism and audit trails. ● Forecast verification tools
--------	---

	<ul style="list-style-type: none"> ● Weather Forecasts by locations and time ● Graphs, tables, plots, histogram ● Seasonal forecast tools ● Route forecasts (tourism, road, helicopter) ● Notification of alerts by email ● Sharing of weather forecasts/ warnings to other agencies/ users automatically as per WMO Common Alerting Protocol (CAP) ● Product integration with NCHM website ● Data download and sharing system
--	--

Task 4: Flood forecasting and warning

There are models like WRF, HBV, Hec-HMS and Hec-RAS. These models output data in various formats and should be integrated into a centralized database. It should be able to post-process the model output with observation and generate warnings/advisories. The output should be displayed on maps in layers.

Function name	Flood Hazard mapping and Forecasts
Input	<ul style="list-style-type: none"> ● Insertion of GIS maps and geospatial data ● Provision to put in flood risk details based on studies/ surveys ● Receive/ accept outputs from hydrological models ● Receive/ accept outputs from meteorological models
Output	<ul style="list-style-type: none"> ● The module should be able to input data to hydrological models in a format required by hydrological models such as HEC HMS, HBV and other hydrological models at NCHM ● The module should integrate hydrological model outputs to central database ● The module should be able to fetch model outputs form hydrological models in formats such as raster, Tiff, shapefile and text files ● The module should provide a platform to view model outputs on maps and tables ● The module should provide an interactive platform to view flood and flow forecast information basin wise ● The module should be able to provide user inputs in terms of defining thresholds for selected basins and stations

	<ul style="list-style-type: none"> ● The module should serve as a decision support system for flood and flow forecasting ● Quality checks – limits, trends with email notification on errors, correction mechanism and audit trails. ● Flood hazard maps for different flood risks - historical/ analysis ● Flood warnings and Forecasts by stations/ rivers/ basins ● Flood hazard mapping - dynamic for Flood decision support system-link result from hydrological model (results from the hydrological models are shown on this system automatically with pre-assigned levels). ● Forecast verification tool ● Notification of alerts by email ● Sharing of flood forecasts/ warnings to other agencies/ users automatically as per WMO Common Alerting Protocol (CAP) ● Product integration with NCHM website ● Data download and sharing system
--	---

Task 5: Pilot briefing service

Pilot briefing is to supply meteorological information to aviation users in order to ensure the safety and regularity of air navigation. Briefing to be integrated with the central server for collecting and printing of flight documentation for pilots based on meteorological data and messages received from the GTS or AFTN networks. It should be capable of automatic handling of data validation where users should easily collect and print all necessary flight documentation containing the local conditions, conditions at the destination and along the flight route.

The stations included in the flight plan should provide the basis for the generation of the PIB (pre-flight information bulletin). Besides standard PIB information like OPMET data, SIGWX and Upper wind-temperature charts, the PIB should contain a cross-section of the temperature and wind conditions along the flight route that also perfectly describe the take-off and landing conditions. The system should be capable of warning the users about all received meteorological or operational warnings like volcanic ash or tropical cyclone advisories, SIGMETs, AIRMETs, as well as other warnings and administrative messages. It should be able to post-process the model output with observation and generate warnings/advisories. The output should be displayed on maps in layers.

The software should help meteorological forecasters to visualize the meteorological information and provide the templates for standard and local forecasts.

An IWXXM module is also required for dissemination and reception of OPMET. The module should include a SADIS subscription to access the data for aviation products.

Functions name	Aviation Met service
Input	<p>Visualization of meteorological information for forecaster:</p> <ul style="list-style-type: none"> ● Local AWOS/RWP data ● OPMET ● SADIS ● GRIB ● BUFR ● Soundings ● Radar ● Satellite ● VAAC and TCAC information ● Space weather information ● WRF ● SmartMet
Output Screen	<ul style="list-style-type: none"> ● Templates for creation of forecasts and warnings: <ul style="list-style-type: none"> ○ AIREP ○ AIRMET ○ GAMET ○ Aerodrome Warning ○ SIGMET ○ TAF ○ TREND ○ Wind Shear Warning ○ other... (e.g. warnings according to regional agreement) ● Meteograms and Cross Sections ● Flight database ● Thermodiagram tools ● Automatic generation of upper air charts ● GRIB layers over map ● SIGWX map layer ● Automatic Delivery of Flight Documentation Folder (mail, FTP)

Task 6- Hardware requirement

The firm needs to access the existing hardware and network and provide the detailed specifications for additional hardware requirements.

Task 7- Training

The bidder should provide on-site training on installation, operation, maintenance, back up and configuration of the software. The training is to be performed “hands-on” using the actual system and applicable user manuals. Training logistics will be handled by UNDP.

The training program should be conducted on Server Administration, database Administrator and user training. The training should include an approximate of 30 people including:

1. Hydrologist;
2. Meteorologist;
3. Aviation Personnel;
4. System/ IT Admin; and
5. Data administrator.

The courses should train these groups of NCHM officials who can then train other end users.

Task 8- Documentation and licensing

The bidder should provide NCHM user manuals and related materials. Documentation should include (but is not limited to) overall description of all major functions and detailed step-by-step operating procedures for each screen and activity. The bidder should revise such documentation as necessary to reflect any modifications made. The bidder should provide with the following documentation:

1. User manuals for using interface;
2. System administrator Manuals - Installations, Maintenance, Backup and recovery of the system;
3. System and reporting;
4. Support and maintenance manuals including routine backup and recovering strategies;
5. The software and modules should be available for N concurrent users; and
6. The firm should provide details of licensing requirements in the proposal and avoid Oracle, Java and related certificates.

IV. KEY DELIVERABLES

1. An Inception report, which includes a summary of the context as per the objectives, tasks assigned, agreed approach and methodology, work-plan and timeline.
2. Submission of the assessment report of current ICT infrastructure and database systems which includes hardware, software, networking, security at NCHM and future recommendations.
3. Submission of detailed Technical Proposal of the system including design and functionalities and technical specifications.
4. Deployment of final products defined as Tasks in the contract/TOR.
5. Provision of the system administration and user training onsite at NCHM.
6. Submission of system certifications and licenses.
7. Submission of system documentation and user manuals.
8. System Acceptance test onsite at NCHM.
9. Final workshop and system launch at NCHM.

V. PAYMENT MILESTONES AND AUTHORITY

The consulting firm will indicate the cost of services for each deliverable strictly in US dollars when applying for this consultancy. In accordance with UNDP rules, the lump sum contract amount to be offered should consider the professional fee inclusive of travel, communications, mission travel to Bhutan, out of pocket expenses, and other ancillary costs.

The qualified consulting firm shall receive his/her lump sum service fees upon certification of the completed tasks satisfactorily, as per the following payment schedule:

Activities/Deliverables	Target Due Dates	Schedule of Payments
<ul style="list-style-type: none">● Inception report which includes a summary of the context as per the objectives and tasks assigned, agreed approach and methodology, and detailed work-plan and timeline● Submission of the assessment report of current ICT infrastructure and database systems which includes hardware, software, networking, security at NCHM and future recommendations● Submission of detailed Technical Proposal of the system including design and functionalities and technical specifications	31 st July, 2022	30% of the contract amount.

<ul style="list-style-type: none"> • Deployment of final products defined as Tasks (Task 1, Task 2, Task 3, Task 4, Task 5) in the contract/TOR. • Provision of the system administration and user training (Task 7) 	30 th September, 2022	30% of the contract amount.
<ul style="list-style-type: none"> • Submission of system certifications and licenses • Submission of system documentation and user manuals • System Acceptance test • Final workshop and system launch at NCHM 	15 th December, 2022	40 % of the contract amount.

VI. APPROACH OF THE WORK

The Consulting Firm will strictly follow the work plan and the time schedule agreed with UNDP as per the guidance from Weather & Climate Services Division (WCSD) of NCHM in undertaking the contract assignment, some of which are as follow:

- An appropriate approach and methodology will have to be determined by the Consulting Firm in consultations with the UNDP and NCHM, as per the Tasks;
- Approach and methodology will be presented during the inception meeting for suggestion and endorsement;
- A committee involving UNDP, NCHM and consulting firm will be formed to work along with the Consulting Firm for knowledge transfer and building up the institutional capacity;
- The Consulting Firm will undertake collection of all the required data/information from various sources. The NCHM will facilitate in collection of the data/information with required official letters and contact with focal person(s) wherever required;
- The Consulting Firm will update and report every month on the progress of work to the UNDP and NCHM;
- The Progress Review meeting will be held every two months from the start of contract,
- The Consulting Firm will keep and share minutes of the meetings/workshops;
- The identified relevant officials from NCHM should be engaged throughout the development process;
- The consulting firm will conduct system administration and user training (on-site) at NCHM;
- Final System/User acceptance test will be conducted (on-site) in presence of the UNDP and NCHM; and

- A workshop will be held after completing the deployment, training and acceptance test and launch the system at NCHM.

The approach and methodology should be clearly documented in the proposal including comprehensive details of the following:

- Plan on assessment of current system (hardware, network and software);
- work plan and schedule;
- training plan;
- system documentation;
- necessary certification of the system in line with WMO and ICAO requirements;
- description of licensing requirements; and
- description of additional subscription requirements for accessing data.

VII. DURATION AND TIMEFRAME OF THE WORK

- The duration of contract shall be from second week of June 2022 to second week of December 2022, and
- Delay in submission of the report as per the agreed time schedule will be liable for payment of penalty as per the contract agreement.

VIII. INSTITUTIONAL ARRANGEMENT / REPORTING RELATIONSHIPS

The Consulting Firm shall work under the direct supervision of the Project Manager/Technical Coordinator, NAP Project, UNDP with due technical consultations with NHCM on day-to-day activities and submit reports as required and agreed in the work plan/time schedule.

IX. DUTY STATION

The work will entail regular involvement of Technical Committee and Project Management of UNDP in Thimphu. The Firm needs to undertake two field missions to Bhutan for assessment of existing systems, installation of hardware, deployment of the system and provision of user training once the travel restrictions are eased by the Government.

X. TEAM COMPOSITION AND QUALIFICATION

The following requirements are a broad description of the minimum expertise needed for this work. The minimum requirement for the team composition is specified under section X of the ToR. Proposed duration of assignment of the experts should align to the proposed approach and methodology, work plan, and based on the proposed team composition.

The consulting firm should:

- Should be a registered firm with at least 15 years of international experience in the field of hydro-meteorology;

- Have successfully completed at least 3 contracts of similar nature, at not less than USD 110,000 each, in last five years in three different countries with reference to delivery of database systems to National hydrological and meteorological Services (NHMS)
- Possess ISO 9001:2015 certificate for Quality Management system (QMS);
- Possess ISO 27001 certificate for Information Security;
- Should have minimum 10 years of experience in software programming, modelling and database management of hydro meteorological systems;
- have an international experience in development of systems in hydrology and meteorology;
- have appropriate and adequate capabilities, resources, and experience to execute the full extent of the scope of services to a very high quality;
- should have WMO and ICAO certifications have extensive experience designing hydro-met systems;
- should meet various criteria of international organizations and standards, including, but not limited to:
 - World Meteorological Organization (WMO)
 - WMO (1983), Guide to Climatological Practices, 2nd Edition, WMO-No. 100, 1983 Geneva, ISBN-92-63-12100-1, chapter 5.2.5.3 - Extreme value distribution.
 - WMO (1996): Climatological Normals (CLINO) for the period 1961-1990. (WMO-No.847). World Meteorological Organization, Geneva, Switzerland
 - WMO (2003) Guide on Climate Metadata and Homogenization. (WMO-No.1186). World Meteorological Organization, Geneva, Switzerland
 - WMO (2011): Guide on Climatological Practices. (WMO-No.100). World Meteorological Organization, Geneva, Switzerland
 - WMO (2010): Guide to Meteorological Instruments and Methods of Observation. (WMO-No.8). World Meteorological Organization, Geneva, Switzerland
 - WMO (2011-2012): Manual on Codes. (WMO-No. 306). World Meteorological Organization, Geneva, Switzerland
 - WMO (2011): Manual on the GTS, Vol.1 Global aspects (WMO-No. 386). World Meteorological Organization, Geneva, Switzerland
 - WMO (1991): Manual on the GTS, Vol.2 Regional Aspects (WMO-No. 386), Geneva, Switzerland
 - WMO (2013): International list of Voluntary Observing Ships, Metadata fields & descriptions, (WMO-No. 47)
 - Klein Tank, A. M. G., F. W. Zwiers, and X. Zhang (2009), Guidelines on analysis of extremes in a changing climate in support of informed decisions for adaptation, Climate data and monitoring WCDMP-No. 72, WMO-TD No. 1500, 56 pp.
 - International Civil Aviation Organization (ICAO)

- ICAO (2011-13): Aeronautical Telecommunications, Annex 10 to the Conventions on International Civil Aviation, International Civil Aviation Organization
- ICAO (2013, incorporating Amendments 1-76): Meteorological Service for International Air Navigation (Annex 3 to the Convention on International Civil Navigation). International Civil Aviation Organization
- ISO 9000 series for quality assurance of design and manufacturing o ISO 9001 Quality Management System
- ISO 10006 Quality Management System in Projects
- ISO 14001 Environmental Management System
- ISO 27001 Information security

The required team composition is as follows:

The team should comprise of members as specified under points 1-3 below:

1. Project Manager: responsible for the project run, responsible for the risk management. He/she will function as Team Leader and should have Ph. D in Meteorology and 10 years of experience in managing similar projects in the field of hydrometeorology. He/she will formulate a dedicated project team with the relevant qualifications, work experience, engagement of diverse stakeholders, communication skills (English), and project management skills;
2. At Least two experts in Meteorology with Ph. D in Meteorology and with at least five years of work experience in relevant fields or M.Sc in Meteorology with eight years of experience in hydro-meteorology relevant fields;
3. At Least two software engineers with M.Sc. or Ph. D with experience in at least three database projects and five years of work experience in the field of hydro-meteorology relevant fields.

The firm may propose the following additional team members based on the ToR.

1. Software Analyst: responsible for the analysis of the specification / customer requirements (includes meteorological experts)
2. Software Architect: responsible for the design of the solution
3. Programming teams: responsible for the software implementation which should consist of following:
 - b. Database: development of the database part
 - c. Java: application development
 - d. Web: web interface development
 - e. Geo: geospatial representation related development
 - f. hydrologist
 - g. meteorologist
 - h. aviation meteorologist

4. Hardware and network expert: responsible for design, installation and testing of the hardware and networking
5. Testers: responsible for the automated as well as manual testing
6. Integrators: responsible for the integration, installation, deployment
7. Support team: responsible for the system support
8. Quality manager: responsible for the quality management

The firm should provide CV that demonstrate the necessary qualifications and proof of experience for the proposed team members.

XI. PRESENTATION OF PROPOSAL

The consulting firm shall indicate the cost of services for each deliverable strictly in US Dollars when applying for this consultancy. In accordance with UNDP rules, the lump sum contract amount to be offered should consider the professional fee inclusive of travel, field mission to Bhutan, communications, out of pocket expenses, and other ancillary costs.

The Technical Proposal document must be submitted along with the following documents:

- A brief background of the bidder;
- Three past contracts of similar nature at not less than USD 110,000 each;
- Evidence of experience in undertaking similar works (provide certifications such as WMO, ICAO & ISO and other standards);
- Technical proposal: A summary of the approach and methodology and timelines for ensuring completion of work within the required time;
- CVs of proposed team members; and
- Financial proposal (all-inclusive lump sum amount with cost breakdown).

Qualified firms are requested to submit proposal in electronic format through procurement.bt@undp.org before midnight of 6th June 2022, Bhutan Standard Time.

XII. CRITERIA FOR THE SELECTION OF THE BEST OFFER

The selection of the best offer will be based on combined Scoring method – where the qualifications and methodology will be weighted a max. of 70% and combined with the price offer which will be weighted a max of 30%.

Criteria	Weight	Maximum Point
Technical	70	
The technical assessment will be based on the following criteria:		
<p>Expertise and experience of the firm in developing systems in hydrometeorology</p> <p>Completed at least three projects in last five years in three different countries with reference to delivery of database systems to National hydrological and meteorological Services (NHMS) 10 point maximum</p> <ul style="list-style-type: none"> Points allocation: completed three projects= 10 points, less than three projects = 5 points <p>Should have 10 years of experience in software programming, modelling and database management of hydro meteorological systems (20 points maximum)</p> <ul style="list-style-type: none"> Points allocation: full 10 years' experience= 20 points, 5-10 years = 10 points, below 5 years= 5 points 		30
<p>Technical competency of the experts</p> <p>Fielding Project Manager with Ph. D and 10 years of experience in managing similar projects in the field of hydrometeorology (9 points maximum)</p> <ul style="list-style-type: none"> Points allocation: 10 years of experience = 9 points, 5-9 years= 7 points, below 5 years = 5 points <p>At least 2 experts in Meteorology with Ph. D in Meteorology and with at least five years of work experience or M. Sc in Meteorology with eight years of experience (3 points maximum)</p> <ul style="list-style-type: none"> Points allocation= 5 years of experience= 3 points, below 5 years= 2 points 		15

At Least 2 software engineers with M.Sc. or Ph. D with experience in at least three database projects and five years of work experience (3 points maximum) Points allocation: 3 database projects= 3 points, below 3 database projects= 2 points		
Quality of technical proposal (methodology) Detail elaboration= 7.5 points Alignment with the ToR = 7.5 points		15
Similar work experiences in the region= full 10 points Similar work experiences but not in the South Asian Region= 5 points		10
Sub-Total A. (Technical)		70
Financial	30	30
Sub-Total B. (Financial)		30
Total (A+B)		100