

REQUEST FOR EXPRESSIONS OF INTEREST (CONSULTING SERVICES – FIRMS SELECTION)

Thailand

Climate Adaptation and Resilience for South Asia (CARE) Project

Loan No./ Credit No./ Grant No.: IDA-D6220

Assignment Title: Developing RDAS – Regional

Reference No. (as per Procurement Plan): TH-RIMES-231645-CS-QCBS

The Regional Integrated Multi-Hazard Early Warning System (RIMES) has received/has applied for financing from the World Bank toward the cost of the Climate Adaptation and Resilience for South Asia (CARE) Project and intends to apply part of the proceeds for consulting services.

The consulting services (“the Services”) include consulting firm for Developing the Regional Resilience Data and Analytics Service (RDAS) – for making available a regional platform for a) improving access to downscaled climate projections and historical climate information, b) integration of sectoral datasets at regional and national contexts, c) deep computational learning and analytical services for identification of the influence of climate parameters to sectoral (agriculture, water resources, transport, finance, planning and others as relevant to regional and in-country stakeholders) parameters, for providing evidence-based guidance for climate-relevant and climate-informed sectoral planning, policy, and decision-making interventions at regional and national levels to support efforts at climate change adaptation as well as national decision support systems. The consulting firm is responsible for fully developing the RDAS from the prototype RIMES has evolved and shall ensure integration of stakeholder/user needs and requirements, per stakeholders’ decision contexts identified that could be supported by RDAS, in the system design and development, provision of technical and users’ capacity building, and development of materials and resources for ensuring sustainability of maintenance, updating and use of the system. The scope of work includes stocktaking of stakeholder institutions and their relevant capacities, gaps and requirements that could be addressed by, and their potential contributions to, RDAS; designing and developing the RDAS; interfacing RDAS with DSSs/portals in Bangladesh, Nepal and Pakistan; undertaking capacity development of stakeholders; and reporting on RDAS activities and outputs.

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

RIMES 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 attention of interested Consultants is drawn to Section III, paragraphs, 3.14, 3.16, and 3.17 of the World Bank's "Procurement Regulations for IPF Borrowers" July 2016 ("Procurement Regulations"), setting forth the World Bank's policy on conflict of interest.

Consultants may associate with other firms to enhance their qualifications, but should indicate clearly whether the association is in the form of a joint venture and/or a sub-consultancy. In the case of a joint venture, all the partners in the joint venture shall be jointly and severally liable for the entire contract, if selected.

A Consultant will be selected in accordance with the QCBS method set out in the Procurement Regulations.

Consulting firms will be evaluated based on the following shortlisting criteria:

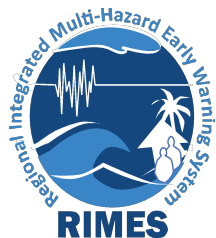
- i) Organizational eligibility
 - a. Must be a registered legal entity and should have been in business for at least 8 years in providing consultancy services of similar or related assignments (the consultant is required to provide copy of Certificate of Incorporation issued by relevant authority in the country of establishment). If associating with other organization(s), all organizations' eligibility shall be evaluated and scored as single entity.
- ii) Organization's proven experience
 - a. Must have at least 5 years of proven working experience in South Asia in undertaking consultancy services relevant to data analytics and hydro-meteorological services delivery in agriculture, water, transport, planning/finance and disaster management (the consultant is required to submit a list of relevant consultancy services undertaken in South Asia during the last 5 years, value and years of performance, which should showcase the expertise/strength of the consultant for undertaking such assignments). The consultant, while describing the assignment(s) for similar work experiences, should also:
 - explain in what way the executed assignment(s) was/were similar in nature to the current assignment
 - explain the exact role it carried out in the assignment if the assignment was undertaken in association with other firms as JV or in sub-consultancy
 - identify assignment(s)' focal person(s) in client/recipient institutions as reference(s)
- iii) Capacity
 - a. Organizational structure (the Consultant shall provide its organogram, with a brief on key functions of its units; in case of association with other organizations, each organization's organogram with corresponding brief of inclusive units shall be provided)

- b. Financial capacity (the consultant shall demonstrate having sound financial standing by submitting audited financial reports or any other credible financial documents for the last 2 years where the consultant's net worth shall be positive).

Further information can be obtained at the address below during office hours 0800 to 1700 Bangkok Standard Time.

Expressions of interest must be delivered in a written form to the address below (in person, or by mail, or by fax, or by e-mail) by February 28, 2022.

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TERMS OF REFERENCE

Consultancy for Developing the Regional Resilience Data and Analytics Services (RDAS)

1. About RIMES

The Regional Integrated Multi-Hazard Early Warning System for Africa and Asia (RIMES) is an international and intergovernmental institution that is owned and managed by its 48 members and the Collaborating States for building capacities in the generation and application of user-relevant multi-hazard early warning information. RIMES was established on 30 April 2009 through the signing by collaborating countries of the RIMES regional cooperation agreement. RIMES was registered with the United Nations under Article 102 of the UN Charter on 1 July 2009. RIMES operates from its regional early warning center, located at the campus of the Asian Institute of Technology in Pathumthani, Thailand.

RIMES' purpose is to provide early warning services according to differing needs and demands of its Member States, for enhanced preparedness and response to and mitigation of natural hazards. Its specific objectives are:

- a) Facilitate the establishment and maintenance of core regional observing and monitoring networks to ensure data availability for early warning;
- b) Provide earthquake and tsunami services within the framework of the Intergovernmental Oceanographic Commission of the United Nations Educational, Scientific and Cultural Organization (IOC-UNESCO);
- c) Support National Meteorological and Hydrological Services (NMHSs) for providing localized hydro-meteorological risk information within the framework of the World Meteorological Organization (WMO); and
- d) Enhance warning response capacities at all levels (national to community) within each national early warning framework.

RIMES provides a portfolio of options for Member States to avail from or contribute to any of these objectives.

2. Background

Socio-economic impacts of climate-related hazards in South Asian countries continue to threaten the countries' economic growth, particularly in key sectors such as agriculture, water, and infrastructure. During the 16th Summit of the South Asian Association for Regional Cooperation (SAARC) in 2010, these countries collectively resolved to strengthen climate resilience. The [Climate Adaptation and Resilience for South Asia \(CARE\) Project](#), financed by the World Bank, aims to contribute to translating this policy into actions through enhanced regional cooperation and knowledge on climate resilience and adaptation and development of standards and guidelines to facilitate climate-resilient planning and investments.

The Project's Development Objective is to create an enabling environment for climate-resilient policies and investments across South Asia, with the following indicators:

- Increased access to regional climate data and analytics for climate-informed decision-making;
- National-level decision-making and planning that are better climate risk-informed;
- Regional climate resilience guidelines incorporated into national standards;
- Sectoral investments supported to include climate risks and resilient design; and
- Institutional capacities strengthened to undertake climate-informed policies and planning.

The project has three components, for Implementation over 5 years:

- 1) Promoting evidence-based climate-smart decision-making, to enhance access to Data required for risk-informed planning and investments;
- 2) Enabling climate-resilient policies and standards for development, to enhance transformation of policies and capacities for climate resilience and adaptation across South Asia; and
- 3) Project management and implementation support.

Component 1 is implemented by RIMES. This component involves the creation of a regional resilience data and analytics service (RDAS) platform and decision-support systems (DSSs) for selected sectors of agriculture, water, road transport, planning and finance in Bangladesh, Nepal, and Pakistan. Component 1 also includes capacity development of users of these systems and their products. **The RDAS is a cloud-based open-access platform for acquiring, storing, managing, processing, analyzing, visualizing, and reporting data, for use in screening climate risks to inform investments** while the DSSs are sector-specific systems linked to the RDAS, and used to assist users in sectoral planning and decision-making.

The RDAS shall be a public-domain and AI-enabled data and analytics platform that will leverage a range of available data and analytical services of relevance to climate-smart development in the South Asia region. It is expected to enable South Asian countries to make climate-informed decisions and policies for climate resilience, based on more accurate and downscaled data and analytics. The RDAS, in addition to existing climate-related observation and early warning systems in the region, will also support **overlaying of different data sources, across climate and socio-economic parameters, to specify hotspots of climate vulnerability across different sectors and timescales, and to support planning and investment decision making**. The RDAS will **leverage existing data systems in countries and sectors and will deploy tools for analysis and interpretation of global and regional circulation models and generate tailor-made downscaled information scenarios** for all SAR countries. As a dynamic platform, it will respond to evolving data needs from sectors and generate, curate and host new climate and thematic data.

3. Objective

The RDAS shall serve as a regional platform for providing; i) improved access to downscaled climate projection and historical climate information; ii) integration of sectoral data sets at national to regional contexts; iii) deep computational learning and analytical services to identify the influence of climate parameters to sectoral (agriculture, water resources, transport, finance, planning and others, as relevant to regional and in-country stakeholders) indicators. The system shall provide evidence-based guidance for sectoral decision making for planning and policy level interventions by taking into account national climate change instruments like National Adaptation Plans. While RDAS would provide support to regional development agencies, national level policy and decision makers would also benefit from the system through relevant historical climate data and/or downscaled climate projections, and analysis thereof against sectoral parameters, to support national efforts at climate change adaptation as well as national decision support systems.

The Consulting Firm is responsible for fully developing the RDAS (i.e. RIMES has developed the prototype). The firm shall ensure integration of stakeholder/user needs and requirements, per stakeholders' decisions identified that could be supported by RDAS, in the system design and development, provide technical as well as user capacity building, and develop materials and resources to ensure sustainability of maintenance, updating and use of the system for the duration of the Contract.

4. Scope of Work

The Consulting Firm is expected to provide end-to-end RDAS development services and capacity-building support. This includes the following tasks:

A. Stocktaking

- *Stakeholders:* Discuss with a broad range of stakeholders (primarily virtually) who can play a role to contribute, analyze, disseminate, or use public-domain climate data services (including Data

on climate variability and change and climate adaptation and/or mitigation). Identify key stakeholder institutions that can be part of an institutional ecosystem involved with the portal development, operation, maintenance, updating, and effective use and monitoring. Propose a Technical Advisory Group and develop a TOR for the group (of about 20 members from government, academia, CSO, private sector, development partners, and other organizations/user group representatives) to provide regular inputs into the development of the RDAS.

- *Decisions*: Identify a typology of decisions/improved understanding that can be supported by the RDAS and related dashboards. In particular, focus on decisions related to climate resilience in the short and longer-term in key development sectors.
- Identify key public (and potentially public) domain data and data services (both climate-related and data related to climate-sensitive sectors) available from global, regional, national, and other sources (e.g., using APIs or [OGC](#) spatial service formats).
- Explore available global public domain data service collations from global, regional and national institutions such as the [World Bank Spatial Agent App and Geoportal](#), [World Bank KIDS Helpdesk applications](#), [World Bank Climate Change Knowledge Portal](#), [WMO](#), [NASA SERVIR](#), [NOAA](#), [G-REALM](#), [ESA Copernicus](#), [Dartmouth Flood Observatory](#), [IRI](#), [KNMI](#), [IPCC](#), [UNISDR](#), [UN Data](#), [ECMWF](#), [GLOFAS](#), [GEOGLOWS](#), [Google Earth Engine](#), [IPCC](#), [UNFCCC](#), various GeoNodes, etc.
- Compile subscription services (e.g. providing online global climate/forecast services or high-resolution earth observation products that can be harvested with APIs), critical data (and associated metadata including source, coverage, frequency of updating, accessibility, format, need for hosting) or software procurement needs
- Identify appropriate climate-related data or analytical subscription services, visuals (e.g. maps, graphs, screen capture videos), online documentation (e.g. reports/videos) relevant to climate data/analytics in the region
- Conduct a thorough technical assessment (i.e., usability, design, programming language, analytics, etc.) of the prototype developed by RIMES in the first year of project implementation to direct/guide the full development of RDAS under this Consultancy.
- Compile a country-wise list of datasets currently accessed and used in, and capacities of (i.e. dissemination methodology, frequency and reliability of advisories provided, etc.), decision support systems (DSSs) in place
- Form an RDAS community user group involving potential users of RDAS from government, private, corporate, and development institutions to serve as RDAS' feedback mechanisms during and beyond the project period.

B. Design and develop the RDAS

- Design the RDAS framework including, but not limited to, system architecture, schema, software, and data services platform, functionality, information flow, graphical user interface, navigation, security level/s, hosting (including for additional data/documents not currently online)
- Identify, collect and organize relevant datasets including, but not limited to, data from in-situ monitoring, earth observation, crowdsourcing, modeling from available public domain data, and data service collations, such as the following:
 - Regional non-GTS (Global Telecommunications System) data-sharing arrangement among nine countries, including Bangladesh and Nepal
 - [R' Climate Data Sharing and Analysis System for Pakistan](#)
 - Global, regional and national institutions
 - Open global and regional data banks such as the World Bank Open Data
 - Data generated from data rescue, formatting, and online OGC services or API facilitation activities
- Develop the data management modules integrating relevant weather/climate information and sectoral data such as the following:

- Historical climate data (e.g., monitoring station information available with WMO and other sources, gridded datasets of temperature, precipitation, lake/reservoir levels, flows, etc.)
- Forecasts (nowcasts to seasonal scale), snowmelt, streamflow, locations of monitoring stations (e.g., climate, water levels, flows, water quality, water diversions, etc.), and associated metadata and data as available
- Climate change projections (CMIP5 and CMIP6 as/when available) on temperature, precipitation, and any modeled implications on streamflow, evapotranspiration, glaciers, snow, etc.
- Relevant physical characteristics like the land cover, topography/DEM, administrative boundaries
- Sector-specific data such as cropland cover map, irrigated areas, soil map, livelihood map, crop-specific information for agriculture sector; grazing map, cattle/poultry-specific data for livestock subsector; basins, watersheds, major aquifers, drainage for water resource sector; road and bridge infrastructure network, multi-hazard assessments for transport sector; environmental data (i.e., forests, protected areas), demographic profile, socio-economic data, climate screening tools, criteria and indicators for planning and finance sectors
- Spatially linked documents (e.g., weblinks, videos/photos, reports, NAPAs/LAPAs, and other adaptation/mitigation documents)
- Establish the RDAS analytics platform using modern data science to ensure enhanced data processing/analysis, visualization, access (for example, by other online systems and free cloud computing platforms such as Google Earth Engine, and services using standard protocols like OGC standards, well-documented APIs), and use of machine learning/AI algorithms
- Data and Analytic Services Catalog: The first version of a modern, searchable data and analytical services catalog should be developed in the first six months with available data and analytical services and basic metadata. This should be sufficient to both power up the first version of the prototype but also usable for competitions (e.g. a Hackathon) using the documentation of these free resources and also be available as a public service for national DSS dashboards
- Design the RDAS graphical user interface and accessibility (i.e., dashboard, interactive maps and overlays, interactive graphs, swipe tools, animations, modern data visualization using open-source platforms and open visualization libraries such as <https://d3js.org/>, including English and various SAR language options with free translation APIs) making sure that users can interactively and intuitively access, analyze and visualize data and/or information using appropriate libraries. The RDAS should be accessible on all common digital platforms/browsers (e.g. on computers, tablets, smartphones, touchscreens, touch tables) in responsive design formats. A first prototype should be developed in six months and updated regularly with design and development sprints.
- Develop the RDAS' export (including deep URLs, embed codes, etc.) and dissemination system using multiple channels (and SAR languages) including API, email, SMS, and mobile app (android and iOS versions), social media
- Coordinate with RIMES and the Consulting Firm for Quality Assurance in the audit of the RDAS, including assisting with system quality and functionality testing, bug fixing and fine-tuning as well as system staging
- Coordinate with RIMES on hosting the RDAS using cloud services for high-quality user experience, and assist with deployment on appropriate systems (e.g., touchscreens, touch tables in select locations)
- Develop a comprehensive plan for continued maintenance, updating, and enhancement of the RDAS, including but not limited to governance and institutional mechanisms, funding, quality management, technical and data support, and capacity-building beyond the project duration
- Develop a user manual/guide for the use of the system

C. Interface with DSSs/portals in Bangladesh, Nepal and Pakistan

- Facilitate/conduct discussions/consultations with country stakeholders in Bangladesh, Nepal, and Pakistan for exploring, understanding, and agreeing on areas of complementarity between RDAS and DSSs
- Discuss and integrate technical inputs and/or recommendations on RDAS (services, metadata, etc.) and DSS interface from targeted CARE beneficiary ministries, development/partner agencies, RIMES PIU, and others as relevant
- Work with DSS Consulting Firms in Bangladesh, Nepal, and Pakistan to ensure linking and interoperability of data (and analytics) services between RDAS and the DSSs/portals developed/enhanced
- Facilitate increased access/use of RDAS via the use of the DSSs/portals among stakeholder ministries and agencies

D. Undertake capacity development of stakeholders

- Organize regular (i.e., monthly and quarterly) learning events such as virtual knowledge sharing/training series, conferences, and other outreach activities in coordination with the RDAS/DSS Lead, IT Experts and DSS Consulting Firms, and building on training/learning plans informed by training/learning needs assessments to be undertaken before learning events
- If required, support RIMES in managing training for RDAS at regional and national levels. Organize at least two regional hackathons/Data Jam competitions that leverage RDAS elements (e.g. Data and Services Catalog, RDAS Platform) to develop data dashboards, mobile apps, interactive e-books, spatial blogs, etc.
- Establish and maintain virtual helpdesk support for the RDAS (e.g. on GIS, data visualization, troubleshooting, help resources), to facilitate data services in the public domain
- Develop a range of knowledge products, including screen capture how-to videos, short training videos featuring the data, analytics, and functionality of the RDAS, interactive e-books/story maps with embedded interactive services, wikis, etc.
- Prepare technical manuals as well as user guides and multimedia presentations to be used in regional training
- Set up and help facilitate a virtual Open Regional User Community to receive feedback and suggestions on RDAS development and users capacity building

E. Report on RDAS activities and outputs

- Discuss monthly progress and action plan for the subsequent month with RDAS/DSS Lead and IT Expert
- Submit the quarterly report on the progress of RDAS development, including implementation challenges, good practices, lessons learned, and recommendations
- Participate in relevant consultations and progress meetings with partners and stakeholders
- Provide updates and inputs to RIMES ICKM Specialist on the RDAS progress and activities for dissemination through CARE project e-newsletter, website/MIS, and RIMES social media accounts
- Assist the M&E Specialist in documenting and reporting on RDAS' registration, access, use, and other metrics/indicators
- Upon full development of RDAS, submit comprehensive documentation on the system, outlining the system development process and outcomes

5. Approach

The Consulting Firm is expected to utilize the following approaches while undertaking these tasks:

- Ensure collaborative design and development process throughout the consultancy period
 - Work closely with the RDAS Technical Advisory Group, RDAS Community User Group, Country Coordinators, Sectoral Experts, IT Experts (in-country IT experts and those working on the RDAS prototype), and RIMES Project Implementation Unit to ensure integration of user needs, requirements and recommendations in the design, full development, capacity enhancement and deployment of RDAS

- Receive inputs from regular consultations with project beneficiaries and stakeholders on the RDAS architecture, modules, functionalities and analytics, graphical user interface, visualization, dissemination module, etc.
- Prototyping: Develop a prototype in a public-domain portal within the first six months of the Contract to help stakeholders visualize the type of platform intended. Use modern agile design sprints (incl. with virtual participation) to collate regular inputs for this evolving prototyping and develop alternative data visualization and interactive analytics options.

6. System Development Requirements

- Overall considerations
 - Flexible and scalable framework (to include open-source databases, etc.) for system development
 - GIT/SVN repository of all source codes, database scripts, test scripts, etc.
- Application quality assurance
 - Well-commented source code (application development) for all system enhancement work
 - Test plans and test cases (including Unit Test Plan, System/Integration Test Plan, User Acceptance Test Plan, Security Test Plan, Load Test Plan, Regression Test Plan)
 - Unit testing, load testing, integration testing
 - Testing documentation (including details of defects/bugs/errors and their resolution)
 - Development and Implementation of security policy (including aspects of cybersecurity and privacy)
 - Database scripts, setup and release notes for each new release
- Platform and technology
 - Use of open-source development language framework e.g., based on Java, PHP, Ruby, etc., and Model View Controller (MVC) based web frameworks for sufficient security and manageability; the consulting firm may propose an alternative development language, providing the details as well as reasons for such
 - Use of open-source databases such as MySQL, PostgreSQL, NoSQL etc.
 - Use of open-source spatial data visualization platform e.g., Leaflet with responsive design that works on common digital devices (smartphones, tablets, computers).
 - Use of free/open-source analytics and visualization platforms/tools
 - Cloud-based hosting (e.g., Google, Amazon AWS, Microsoft Azure, etc.) based on detailed consideration of options from an availability, cost, security, performance, and ease of use perspectives
- Data access policy
 - The RDAS platform shall primarily integrate free and open-source data available at the sub-national, national, and regional levels. Other data, either procured or accessed from countries or other sources, which may be considered sensitive, shall be placed under data protection policy in the system, and secured and restricted access shall be provided to different user groups.

7. Responsibilities of RIMES

RIMES shall support this assignment by facilitating access to Data and stakeholders, monitoring progress, and providing technical guidance and feedback.

8. Reporting Requirements and Payment Schedule

The consulting firm shall report to RIMES' Project Implementation Unit (PIU) and work under the direct supervision of the RDAS/DSS Lead and Project Director, who will monitor and review progress and quality of work every month. The consultant shall dispatch a team to be based in Bangkok, Thailand, where RIMES is headquartered and should have staff present in Bangladesh, Nepal, and Pakistan, for coordination with

RIMES' Country Coordinator and IT Expert under the CARE Project, among other tasks they would carry out in the countries.

The assignment will be delivered in 39 months at the most. The final payment schedule will be agreed upon with the firm based on the final work plan and schedule of deliverables. A preliminary schedule of payments will be as per the following.

Item	Deliverables	Percentage of the total price	Estimated Timeline
1	Development approach, methodology, and work plan for RDAS development	5%	On contract effectiveness
2	Report on stocktaking outcomes, including a detailed inventory and catalog of data and analytic services, and proposed framework and data parameters for the RDAS	20%	Within six months from contract effectiveness
3	RDAS design & development: data management modules for the RDAS	25%	Within 12 months from contract effectiveness
4	RDAS design & development: data analytics module, data visualization, and interface modules, dissemination module (web-based system, mobile app, etc.), and interface with DSSs/portals in Bangladesh, Nepal, and Pakistan, including a user manual for the system	30%	Within 24 months from contract effectiveness
5	Capacity development of stakeholders (including a user guide and technical manual, training, hackathons)	10%	Within 36 months from contract effectiveness
6	System transfer and deployment (including final documentation, helpdesk services), and final report featuring a comprehensive plan for RDAS' sustainability	10%	Within 39 months from contract effectiveness

RIMES' PIU shall provide necessary guidance and coordination. All outputs shall be submitted to RIMES' PIU for review and approval. These include, but are not limited to i) software requirement specification document, ii) software design document, iii) functional and audited software with source code, database, and scripts, iv) administrator manuals including detailed metadata document, v) setup and release notes for each new release, vi) test cases and reports, and all other relevant documents and software.

Progress reports shall be in English language and submitted digitally. However, the RDAS training guides, manuals and related capacity-building materials must be developed in English and SAR countries' official languages (i.e., Bengali, Urdu, Nepali, Dari, Dzongkha, Hindi, Dhivehi, and Sinhala). These outputs will become the property of RIMES on behalf of beneficiary ministries/agencies until the end of the project; the consulting firm shall not use, replicate, and reproduce these outputs in any manner without RIMES and/or the ministries/agencies' consent.

9. Contract Duration

The entire work is expected to be completed within 39 months.

10. Key Staff

The consulting firm shall comprise, but not be limited to, the following key staff with corresponding qualifications. Shortlisted firms are expected to propose a team composition with the number of person-days involved when submitting technical proposals.

- 1) Team Leader, ideally a system developer and project management professional, with the following minimum qualifications:
 - a) Master's degree or higher in computer science, data science, statistics, or related fields
 - b) Over 15 years of professional experience in software/database development and management
 - c) Over ten (10) years of experience leading development teams in requirement analysis, design, development, and quality assurance of software solutions
 - d) Excellent problem-solving, organizational, and presentation skills
 - e) Strong written and oral English communication skills
- 2) Deputy Team Leader, having the following minimum qualifications:
 - a) Master's degree or higher in computer science, data science, statistics, or related fields
 - b) Over ten years of professional experience in software/database development and management
 - c) Over six (6) years of experience leading development teams in requirement analysis, design, development, and quality assurance of software solutions
 - d) Excellent problem-solving, organizational, and presentation skills
 - e) Strong written and oral English communication skills
- 3) Climate Change Expert, with the following minimum qualifications:
 - a) Master's degree or equivalent in atmospheric science or climate-related fields
 - b) At least five (5) years of experience in climate services, climate change projection analysis, and impacts analysis
 - c) Knowledge of data and decision support systems is an advantage
 - d) Demonstrated experience in working with government ministries/agencies
 - e) Proficiency in spoken and written English as well as any of the three pilot countries' official language
- 4) Agriculture Expert, with the following minimum qualifications:
 - a) Master's degree or equivalent in agriculture science or engineering or related fields
 - b) At least five (5) years of experience in climate impacts analysis on agriculture
 - c) Knowledge of data and decision support systems is an advantage
 - d) Demonstrated experience in working with government ministries/agencies
 - e) Proficiency in spoken and written English as well as any of the three pilot countries' official language
- 5) Water Resources Management Expert, with the following minimum qualifications:
 - a) Master's degree or equivalent in water engineering or related fields
 - b) At least five (5) years of experience in climate impacts analysis on water resources management
 - c) Knowledge of data and decision support systems is an advantage
 - d) Demonstrated experience in working with government ministries/agencies
 - e) Proficiency in spoken and written English as well as any of the three pilot countries' official language
- 6) Transport Expert, with the following minimum qualifications:
 - a) Master's degree or equivalent in transport engineering or related fields
 - b) At least five (5) years of experience in climate impacts analysis on transport
 - c) Knowledge of data and decision support systems is an advantage
 - d) Demonstrated experience in working with government ministries/agencies
 - e) Proficiency in spoken and written English as well as any of the three pilot countries' official language

- 7) Disaster Risk Reduction Expert, with the following minimum qualifications:
 - a) Master's degree or equivalent in disaster management or related fields
 - b) At least five (5) years of experience in climate/extreme events analysis and disaster risk management
 - c) Knowledge of data and decision support systems is an advantage
 - d) Demonstrated experience in working with government ministries/agencies
 - e) Proficiency in spoken and written English as well as any of the three pilot countries' official language

- 8) Planning and Finance Management Expert, with the following minimum qualifications:
 - a) Master's degree or equivalent in finance, planning, or related fields
 - b) At least five (5) years of experience in climate-informed planning and finance
 - c) Knowledge of data and decision support systems is an advantage
 - d) Demonstrated experience in working with government ministries/agencies
 - e) Proficiency in spoken and written English as well as any of the three pilot countries' official language

- 9) Technical Lead and Quality Assurance Specialist, with the following minimum qualifications:
 - a) Master's degree in computer science, information/communication technologies, data science, statistics, or related fields
 - b) Over ten (10) years of professional experience in data analytics, web applications, database development, and management with a minimum of five (5) years of experience in reviewing and analyzing system design, development, and Implementation
 - c) Knowledge of security and quality assurance methods, standards, and tools for web applications and databases
 - d) Proficient in various open-source programming languages (e.g., Python, R, JavaScript, CSS, PHP, HTML5, Java), data management systems (e.g., PostgreSQL, MySQL, NoSQL), current and emerging technologies, modern applications
 - e) Excellent problem-solving and analytical skills with attention to detail and quality
 - f) Strong communication skills

- 10) Senior Web Application Developer, with the following minimum qualifications:
 - a) Bachelor's degree or higher in computer science, information/communication technologies, or related fields
 - b) Over five (5) years of experience in software/database development and management, and analysis tools
 - c) Strong knowledge of Web Map services, Open Layers, Google Earth Engine
 - d) Strong technical knowledge of systems networking, databases, and web development
 - e) Proficient in various open-source programming languages (e.g., Python, R, JavaScript, CSS, PHP, HTML5, Java) and data management systems (e.g., PostgreSQL, MySQL, NoSQL)

- 11) Senior Data Scientist, with the following minimum qualifications:
 - a) Bachelor's degree or higher in computer science, data science, mathematics, statistics, or related fields
 - b) Over five years of experience in software/database development and management, and analysis tools
 - c) Extensive knowledge of processing structured and unstructured data, with strong analytical skills and ability to understand, classify data and analyze patterns
 - d) Strong technical knowledge of database architecture and machine learning algorithms
 - e) Knowledge about data mining and weather data formats
 - f) Strong knowledge of R, Python and MATLAB, JavaScript, and other statistical tools

12) Senior Visualization Expert, with the following minimum qualifications:

- a) Bachelor's degree or higher in computer science, information technology, data science, or related fields
- b) Over five years of experience in software/database development and management, and analysis tools
- c) Extensive knowledge of data processing and optimization techniques and data format conversion
- d) Knowledge of structured and scientific data management and visualization, data mapping, and storytelling
- e) Strong knowledge of Data as a Service, REST API services, and web services as well as data formats like GeoJson, ESRI shapefiles, Scientific data NETCDF, GRIB (gridded Binary), HDF
- f) Strong knowledge of statistics and Knowledge of HTML, CSS, essential libraries, and scripting tools like R, Python, and JavaScript, D3, Tableau etc.,
- g) Demonstrable design knowledge, such as layout, typography, color, interaction design

13) Mobile App Developer, with the following minimum qualifications:

- a) Bachelor's degree in computer science, information/communication technologies, or related fields
- b) Over five years of experience in software/database development and management
- c) Demonstrable portfolio of released applications on the App Store or the Android market
- d) Extensive knowledge of open-source programming language
- e) Knowledge of OOP design principles and third-party libraries and APIs

14) GIS and Remote Sensing Specialist, with the following minimum qualifications:

- a) Bachelor's or higher degree in remote sensing/GIS, geo-informatics, computer science, or related fields
- b) Over five years of experience using GIS Server geoprocessing services, including developing programming scripts
- c) Working experience of web-based map viewers and mapping tools

15) Software Engineers (i.e., support staff including Database Experts, Data Scientists, Web Application Developers, Visualization Experts, Mobile App Developers), with the following minimum qualifications:

- a) Bachelor's degree in computer science, data science, statistics, or related fields
- b) Over five years of experience in software/database development and management
- c) Good knowledge of modern computer hardware, software, connectivity, and online services
- d) Strong GIS skills and a solid understanding of machine learning and artificial Intelligence

16) Translators for SAR countries' official language, the firm engages on an as-need basis.

11. Shortlisting Criteria

i) Organizational eligibility

- a. Must be a registered legal entity and should have been in business for at least 8 years in providing consultancy services of similar or related assignments (the consultant is required to provide copy of Certificate of Incorporation issued by relevant authority in the country of establishment). If associating with other organization(s), all organizations' eligibility shall be evaluated and scored as single entity.

ii) Organization's proven experience

- a. Must have at least 5 years of proven working experience in South Asia in undertaking consultancy services relevant to data analytics and hydro-meteorological services delivery in agriculture, water, transport, planning/finance and disaster management (the consultant is required to submit a list of relevant consultancy services undertaken in South Asia during the last 5 years, value and years of performance, which should showcase the expertise/strength of the consultant for undertaking such assignments). The consultant, while describing the assignment(s) for similar work experiences, should also:
 - explain in what way the executed assignment(s) was/were similar in nature to the current assignment
 - explain the exact role it carried out in the assignment if the assignment was undertaken in association with other firms as JV or in sub-consultancy
 - identify assignment(s)' focal person(s) in client/recipient institutions as reference(s)

iii) Capacity

- a. Organizational structure (the Consultant shall provide its organogram, with a brief on key functions of its units; in case of association with other organizations, each organization's organogram with corresponding brief of inclusive units shall be provided)
- b. Financial capacity (the consultant shall demonstrate having sound financial standing by submitting audited financial reports or any other credible financial documents for the last 2 years where the consultant's net worth shall be positive).