Government of Jammu & Kashmir
Department of Ecology, Environment & Remote Sensing
****

Invitation for

EXPRESSION OF INTEREST

for

Satellite and AI-based real-time mapping and monitoring of wetlands & urban agglomeration of Bandipora district of Jammu and Kashmir

Government of Jammu & Kashmir
Department of Ecology, Environment & Remote Sensing
****

REQUEST FOR EXPRESSION OF INTEREST
for
Satellite and AI-based real-time mapping and monitoring of wetlands & urban agglomeration of Bandipora district of Jammu and Kashmir

On behalf of the Lieutenant Governor of Jammu & Kashmir, The Department of Ecology, Environment, and Remote Sensing, Government of Jammu & Kashmir (JK-DEE&RS) of the Union Territory (UT) of Jammu and Kashmir (J&K), is seeking services of a reputed IT and Remote sensing companies/consultancies/organizations/institutes with proven track record of having worked in the field of satellite and AI-based mapping and monitoring of wetlands and cities, for real-time monitoring of wetlands & urban agglomerations of Bandipora district of Jammu and Kashmir.

Interested parties may submit Expression of Interest (EoI) by or before 6th June, 2023 to the Director, Department of Ecology, Environment, and Remote Sensing of the Union Territory of Jammu and Kashmir (J&K), Paryavaran Bhawan Transport Nagar, Gladini Narwal, Jammu **through email at** dirjkers@gmail.com. The subject should be clearly mentioned as "EXPRESSION OF INTEREST FOR SATELLITE AND AI-BASED REAL-TIME MONITORING OF WETLANDS & URBAN AGGLOMERATION OF BANDIPORA DISTRICT OF JAMMU AND KASHMIR". The applying parties shall be called to make a Power Point presentation on completed projects and the technologies used.

The complete EoI document is available on our website www.jkdears.com. It is important to note that DEE&RS shall not take responsibility for any delay resulting in non-receipt of EoI within the specified date and time. Furthermore, DEE&RS reserves the right to reject any or all EoIs at any time without providing any reason for the same.

The following are the important dates regarding the submission of EOI:

Date of issue of EOI	6th May 2023
Last date for query may be emailed to dirjkers@gmail.com (in *.xls/*.doc format only)	15th May 2023
Last date for Submission of EoI	6th June 2023
Shortlisting of eligible Firms	10th June 2023
Presentation by shortlisted bidders	15th June 2023
Evaluation of EoI	17th June 2023
Declaration of Shortlisted firms	20th June 2023

Place: Jammu
Dated: 05-05-2023

Director,
Ecology, Environment & Remote Sensing
J&K, Govt.

Jammu/Srinagar

Website: www.jkdears.com   **Tel/Fax :   0194-2494585 (S)**
e-mail : dirjkers@gmail.com   **0191-2474553 (J)**

INSTRUCTIONS TO IT AND REMOTE SENSING COMPANIES/CONSULTANCIES/ORGANIZATIONS/INSTITUTES

Applicants shall provide the following information in the respective formats given in the EOI document:

• EOI Form: Letter of Application (Form 1)

• EOI Form: Applicant's Information (Form 2)

• EOI Form: Work Experience Details (Form 3(A), 3(B) & 3(C))

• EOI Form: Capacity Details (Form 4)

• EOI Form: Key Experts List (form 5)

The formats for the same is given in Annexures at the end of the document

EXPRESSION OF INTEREST

FOR

Satellite and AI-based real-time monitoring of wetlands & urban agglomeration of Bandipora district of Jammu and Kashmir

Table of Contents

1.   BACKGROUND

Wetlands play a critical role as ecosystems, offering a multitude of advantages for both humans and wildlife alike. In addition to their ecological functions, wetlands play a vital role in mitigating climate change by storing large amounts of carbon. The wetlands of Kashmir region of UT of Jammu and Kashmir have been subjected to substantial risk from human activities such as unauthorized construction, illegal occupation, pollution, siltation, climate change, dumping of waste, invasive species, overfishing, and hunting. These activities have jeopardized the ecosystem of the wetlands, which is crucial for the survival of several species of plants and animals and the livelihood security of the local communities. Regular monitoring and assessment of the health of the wetlands are indispensable in safeguarding these valuable ecosystems for present and future generations.

Additionally, monitoring urban areas is also crucial because unregulated and unplanned urban growth leads to depletion of natural resources in general and wetlands, in particular. It can have other serious repercussions like encroachments on natural habitats, change in land use, strained urban infrastructure, shortages of water and energy, exacerbate social inequalities, development of informal settlements, loss of agricultural land, water pollution, loss of green spaces, soil degradation etc. Monitoring land use changes, encroachments, drainage patterns, road conditions, waste management, and public amenities is vital for promoting sustainable development in urban areas. This helps urban planners and policymakers to pinpoint areas in need of

I/210800/2023

improvement and implement targeted interventions. Moreover, efficient resource management can reduce the environmental impact of urban areas, address climate change, promotes equitable and inclusive development and contribute to sustainable development goals.

Proposal is invited from reputed IT and Remote sensing companies /consultancies /organizations/ institutes with proven track record of having developed automated systems for real-time monitoring of wetlands and urban agglomeration for developing one such system for the indenting department.

2.   Objective of the Assessment

The Department of Ecology, Environment, and Remote Sensing (JK-DEE&RS), Govt. of J&K is interested to develop a real-time monitoring system for wetlands and urban agglomeration in District Bandipora of Jammu & Kashmir using satellite and AI technology to enable the authorities with last mile visibility on the status of the wetlands and urban areas in a real-time basis to timely detect and respond with necessary action for protection and conservation of wetlands and urban areas to enhance the quality of life of the residents of the District.

3.0   SCOPE OF WORK

The scope of work would include real-time monitoring of wetlands and urban agglomeration in District Bandipora of Jammu & Kashmir through use of state-of-the-art technologies like IT, GIS, Remote Sensing and Big Data analytics for timely escalation and interventions. An automated system with web-based interactive Geoportal interface may be developed to provide real-time information on the ecological status of wetlands, and their perceivable threats in the immediate surrounds and catchment area. In addition, it will provide information on urban conglomerates regarding the status of the public facilities like road, drains, green spaces, waste management encroachment, heat islands, critical infrastructure vulnerability etc. The geoportal-based dashboard should indicate the real time vulnerability of wetlands and urban systems in order to issue alerts

for swift response by the authorities concerned. A companion mobile application should enable field data collection, analytics reports, and land transformation detection modules. More detailed information can be found in the sections below.

a. **WEB-BASED GEOPORTAL (WETLANDS & URBAN SYSTEM)**

A web-based system that utilizes remote sensing data and artificial intelligence for real-time monitoring of water availability, water quality, water fowl habitat, health index of water bodies, land use / land cover change status and monitor public facilities like road, drains, green spaces, waste management encroachment, heat islands, critical infrastructure vulnerability etc. A Geo-IT enabled system should integrate spatial and non-spatial data into a centralized database and handle large volumes of frequent updates. The system should improve sharing and accessibility of technical information among stakeholders. Core components include robust and scalable technology and the ability to expand to cover the entire Jammu and Kashmir region for planning, execution, documentation, and reporting of actions taken by stakeholders to manage, protect, monitor wetlands and ULB level planning. The components are given below:

i. Map interface & GIS data: The interface should be interactive with maps and allow zooming, panning, and layer selection. It should include current GIS data on wetlands (location, size, type, water quality, hydrological conditions, and catchment characteristics) and ULB's (road, drains, green spaces, waste management encroachment, heat islands, building footprints, critical infrastructure vulnerability etc.) collected using remote sensing, ground-based surveys, and other methods.

ii. GIS Tools: The GIS tools should have an integrated and easy-to-use dashboard displaying various GIS maps with administrative boundaries, political divisions, agriculture, demographic data, and thematic layers. The dashboard should have interactive layers with information boxes and functionalities like zooming in/out. The tools should display water and urban system related information, including indices, basin and watershed details, and real-time data on water availability, quality, depth, types of houses, infrastructure, facilities etc.

iii. Data archive & management system: The archive data module should enable users to store historical data in a standard format with updated date and frequency. The system should store, organize and analyze GIS data on wetlands and ULBs and compare different layers based on their true geographic location, where each layer is geo-referenced and interlocked for analysis.

iv. Monitoring & Visualization tools: The geoportal should have monitoring and visualization tools like charts, graphs, and maps with satellite imagery for tracking changes in wetlands and urban area conditions over time, including remote sensing, field surveys, and secondary data sources.

v. Mobile compatibility: The geoportal should be mobile-compatible to enable users to access and contribute data from the field.

vi. Real-time integration of geoportal and mobile app-based survey: This system should allow exchange of data between two platforms during the survey. The receiving and sending end should be compatible in data formats (OGC complaint) and exchange mechanism.

vii. Spatial analysis & Modeling tool: Spatial analysis and modeling tools should be used to analyze geographical data by modeling attributes through spatial associations, mathematical, predictive, and AI/ML modeling for interpreting changes, predicting outcomes, and uncover patterns within the data.

viii. Query builder: A well-designed query builder should be there to help users quickly and easily extract the data they need for analysis, reporting, or decision-making.

ix. Reporting & Analytics module: A tool or feature should be there to allow users to generate reports and perform data analysis on the geospatial data stored in the portal.

x. Alert warning: An alert warning system tool should provide notifications or warnings to users/government officials when specific events or conditions occur. For example, an alert warning system for wetlands might trigger an alarm when water levels rise above a certain threshold or when the water quality falls below acceptable levels.

xi. Decision support system: A computer-based tool that should provide decision-makers with the information about the problems in the wetlands, unplanned construction, factors and hotspots for interventions to make scientifically backed informed decisions.

xii. User/content management & Communication module: A user management system should be there to control access to spatial layers and features, and communication tools such as messaging and chat for collaboration among users and sharing information about wetlands for interventions.

xiii. Data Control/Admin Module: The data control module should allow administrators to manage data access by implementing role-based access control, restricting access to specific features and datasets based on user roles, and providing configuration capabilities for the database.

xiv. Unified Database: The system should have the capability to aggregate and unify spatial and non-spatial data from various sources into a single database with a standardized data model and allow data to be stored on different servers for optimal efficiency. It should support various data input methods and allow for crowd-sourced data and digitized data to be integrated as well.

xv. System Requirement & Configuration: The geoportal should have all the crucial system requirements and configurations like configured server, operating system, processing power, memory, storage capacity, web server software, database management system, and GIS software. Web application development should have a web development framework and front-end technologies. Security measures should include firewalls, SSL encryption, backup and recovery plan.

b. MOBILE APPLICATION (WETLANDS & URBAN SYSTEM)

A mobile application with geo-intelligent features should facilitate field data collection for surveying water bodies, verifying encroachments, and collating various types of input data from users. The app should allow users to capture field data, submit information, and geo-tag images and data for upload onto the server. It should be designed for offline data entry and can accommodate any frequency of data submissions. An admin module should ensure that data is uploaded or edited only within their jurisdiction. The app should act as an interface between field information and officials, providing easily shareable information. The features and functionalities of mobile app should be:

i.   Support cross-platform (Android, IOS, etc.) with focus on simplicity, great performance, attractive design, user-friendly GUI and icons/themes.

ii. Registration by user type (Authorized government, authorized non-government and Citizen, contact details, etc.)

iii. Data Collection and collation (Unique ID, Observation Date, Time, Latitude, Longitude, Elevation, Water Depth in water bodies, Water Quality, Encroachment, ULB Amenities, Geo-tagged Photos, Videos, Text, Grievances, Surveys, etc.)

iv. Language: English, Urdu, Hindi

v.   Auto Sync – data sync automatically to the server and temporary data storage capacity for offline use till it gets synced

vi. Pull data while user change the mobile device

vii. Offline and Online Support

viii.   Compatible with 2G/3G/4G/5G Connectivity

ix.   Automated notifications and alerts (push and local) to the community and stakeholder

x.   Should be Integrated for seamless data flow and workflow Management between the server and the other field level data

xi.   Should be flexible to add and customize workflow and survey activities

xii.   Secure storage of data to ensure privacy and confidentiality

xiii.   Integration with third-party apps for sharing and analysis of data

c. URBAN AGGLOMERATION MAPPING & MONITORING

Rapid population growth is causing unauthorized development to expand, leaving urban areas vulnerable to external factors like natural disasters and inadequate social infrastructure. In order to plan effectively at the level of Urban Local Bodies, it is necessary to conduct a micro-assessment of urbanization, developmental processes, and exposure to vulnerability. The evaluation will facilitate governments in gathering data more efficiently, leading to improved and enduring urban growth, while also enabling the administration of the district's water resources, including Asia's largest freshwater lake.

This module should employ remote sensing data to facilitate real-time mapping and monitoring of land use and land cover changes, as well as encroachment activities in the Bandipora Urban Agglomeration. The satellite data will be used to obtain a comprehensive understanding of the availability and condition of essential amenities in the ULB, such as road networks, drainage systems, water supply networks, solid waste disposal facilities, compost waste dumping points, and green cover.

The generated datasets analyzed using AI-based techniques shall be used to classify different land use categories, detect changes in land use, and predict future urban growth patterns. Additionally, the module must be designed to identify newly occurring encroachments and alert the authorities to unauthorized urban expansion.

The monitoring process should be able to assess the state of the ULB facilities and infrastructure, including the vulnerability of critical infrastructure, and carry out zonation

of ULBs according to their vulnerability. To facilitate real-time mapping, monitoring, and dissemination of information and data to the government and stakeholders, a geo-enabled IT system and companion mobile application should be developed, as described in **sections (a) and (b).**

d. MAPPING & MONITORING OF WETLANDS

Following application areas are expected to be covered in the web portal and mobile application [**sections (a) and (b)].**

1. Encroachment Monitoring & Removal Workflow

The increasing encroachment of water bodies is a significant issue for government authorities, as it poses legal and safety concerns. Wetlands in the UT are prone to recurrent floods and waterlogging, necessitating their restoration and protection, and removal of encroachments. The reclamation process requires a systematic approach, and this module can help by identifying new encroachments and providing guidance throughout the entire workflow. Remote sensing can be utilized for continuous monitoring, which can aid in mitigating this problem. Steps that can be taken to identify encroachment:

i. Historical Encroachment Assessment: This module would utilize historical/archival satellite imagery and apply AI algorithms to identify any changes in the defined area of water bodies compared to their revenue shape files and actual area. The purpose is to detect any loss of capacity due to changes in the area. Once any changes are identified, the module will send violation alerts to the relevant department users for field validation and further necessary action.

ii. Continuous Encroachment Assessment with high resolution satellite data: This module will be designed to use high resolution satellite imagery, AI algorithms, and departmental workflow integration to detect new encroachments and provide guidance for the entire reclamation process. Its primary goal is to:

- Regularly monitor water bodies using high resolution satellite imagery on specific intervals.

- Detect any changes or encroachments in wetlands.

- Identify any re-encroachments on previously reclaimed land.

- Verify any encroachments using a rigorous QA/QC process.

- Provide an end-to-end workflow for validation, escalation, and evidence collection.

The system will automatically generate alerts for such cases, and department officials can easily locate these hotspots through a mobile app and provide reports complete with geo-tagged pictures and videos. Continuous monitoring and review of encroachment cases will be conducted, and land-use data will be presented through interactive visualization accessible on desktop and mobile devices. The alerts will be escalated through the department hierarchy to ensure prompt resolution of the cases.

iii. Encroachment Reporting Module: The system will comprise of two modules, namely the Citizen Module and the Admin Module. The Citizen Module will allow any citizen to report cases of encroachments on wetlands by capturing geotagged data as evidence through their smartphones. The system will cross-check the details of the land parcel and assign the case to relevant authorities for further action. On the other hand, the Admin Module will provide a consolidated view of all alerts and enable authorized personnel to add new alerts. This module will guide administrators through the entire lifecycle of alerts.

The mobile-based encroachment workflow will involve three types of users: Authorized Government Users, Authorized Non-Government Users, and Citizens.

Authorized Government Users will be able to perform a variety of actions such as adding new wetlands, updating existing ones, marking different types of encroachments, and executing workflows for assessments, encroachment validation, and the reclaiming process. Additionally, these users will be able to assess water quality through mobile app surveys or by uploading lab test reports, including point-level pollutant data, inflow records, and other relevant metadata information.

Authorized Non-Government Users will be able to add information about extinct wetlands and streams based on their local knowledge, report encroachments, and

assist in survey activities. They will also be able to report on the quality of wetlands and any unauthorized usage, aside from encroachments.

Citizens will have access to a mobile app that will allow them to report grievances related to wetlands, encroachment activities, and water quality issues. They will be able to track the complete lifecycle of their reported concerns. Rewrite and reduce the content.

2. Water Spread Area

The module should extract water spread area data for wetlands using optical and microwave technology and displays it in a dashboard for easy access and analysis. The module should aim to facilitate protection and rejuvenation of wetlands by providing near-real-time monitoring of their status. It should include:

i. Historical Mapping: Satellite data from the past two decades should be utilized to map wetlands by calculating water spread and DEM-based volume. This approach should identify the wetlands that have reduced in size or have been lost over time. Identified water bodies should be sent for further validation to authorized users.

ii. Optical Satellite Data based Detection: Optical satellite remote sensing-based indices (NDWI or MNDWI etc.) and AI technology should be used to map water spread area of wetland. AI algorithms should be used to automate mapping and delineation of the water body and provide accurate information on its extent and changes over time.

iii. Microwave Satellite Data based Storage Estimation: Microwave satellite data should be used to map the water spread area for wetland, which would help in determining their storage capacity. A mobile app should be used to report the current storage and cultivated area under the wetlands at regular intervals.

3. Water Quality Monitoring

Utilizing open-source satellite images, the proposed system should monitor water quality parameters on a regular basis using developed algorithms. The module should enable water quality monitoring through crowd-sourced data, in-situ handheld sensors, lab reports, and AI models, providing detailed insights through various dashboards.

- Have a monitoring, alert, and prediction model for ascertaining water quality issues at various wetlands of the UT.
- Display Water Quality parameters from lab test or in-situ handheld sensor based for wetlands under extreme threat with respect to individual parameters like BOD, COD, Dissolved Oxygen, Chloride, pH, Temperature, Nitrate, Coliforms, EC/ Salinity/ TDS, and Turbidity etc.
- Real-time analytics through user friendly interactive dashboards and water quality reports.
- Create an alert system to notify relevant authorities in case of any issues pertaining to significant drop in water quality though emails, WhatsApp or text and show the same as alert on geoportal.

i. Satellite Based Detection: The system should use remote sensing techniques to monitor water quality parameters such as water clarity, turbidity, water color, and concentrations of optically active constituents. Other parameters to be monitored include eutrophication status, Azolla cristata, aquatic vegetation cover chlorophyll index, concentrations of algal pigments, suspended solids, and colored dissolved organic matter (CDOM).

ii. In-situ Sensor Based Real time monitoring of Quality parameter: Handheld in-situ probes would be used to measure water quality parameters like turbidity, chlorophyll-a, total dissolved solids, BOD, COD, DO, temperature, total suspended solids, and pH etc. Collected processed data should be used to develop algorithms for monitoring and controlling quality parameters, which can range from simple rule-based systems to complex machine learning models. Algorithms must be tested in real-time for accuracy and validity before implementation.

iii. Mobile App and Lab Sample Analysis: A mobile application should be developed to enable sharing of information among field officials. The application should have custom entry forms for users to input data on water level, volume, and various water

quality parameters including BOD, COD, dissolved oxygen, pressure, chloride, pH, temperature, nitrate, coliforms, EC/salinity/TDS, and turbidity. The data should be uploadable through an interactive form or lab test report that would be used to develop a water quality status index using GIS techniques for zonation of wetland.

4. Evaluating the Catchment Characteristics for Water Holding Capacity via Satellite Observation

i. Satellite Based Water Availability Dashboard: A dashboard should estimate the frequency of water occurrence in wetlands using historical and current satellite imagery, meteorological data, and discharge data. The estimate should determine the percentage of time that water is present, capturing annual, intra-annual, inter-annual, and seasonal variations. Water indices, machine learning techniques, and seasonality data should be used. The dashboard should identify changes in water spread area and wetlands disappearance to determine the causes of wetlands occurrence and recurrence during different time periods.

ii. Catchment and Drainage Delineation: Catchment boundaries should be extracted using topographic and river network information through GIS tools. The stream network should be extracted with high granularity and inflow forecast points, wetland locations, and gauge points should be identified. Self-catchment areas should be created for each point of interest by considering upstream locations. Flow direction should be generated based on slope from the stream network extracted from the DEM.

iii. Hydrological Response of Catchment: The module should estimate daily runoff into the water body using rainfall and weather data. Sediment delivery models should be used to quantify the sediments generated due to soil loss in catchments and delivered to wetland/lakes. Remote sensing data should be used to detect existing water conservation structures to estimate the amount of runoff conserved. The data should help estimate the net yield into the wetland/lakes at different levels of reliability.

iv. Solid waste dump identification: This module should use high-resolution satellite imagery to detect solid waste dumps in or near wetlands. The system should periodically assess the status of each identified dump and send notifications when changes occur. Periodic analytics should provide information on the count of solid waste dumps, percentage changes, and district performance rankings based on solid waste removal.

5. De-siltation Identification

In this module, drones should be used to survey high priority wetlands and detect silt deposits automatically. The module should facilitate an end-to-end workflow for requesting drone surveys, ingesting preprocessed data, and providing output for silt notification and removal workflow. To measure the depth of wetlands and check the underwater features, bathymetric surveys should be used. The outputs from surveys should serve as a baseline reference for verifying the amount of silt removed. After desilting, a USV should remap the area to generate a new layer for accurate silt removal estimation. The layer should be added to the geoportal, and the silt removal workflow should be initiated accordingly.

4.0 PROPOSED DELIVERABLES

a) Develop an Inception report that includes System Requirement Specifications and Complete Project Plan.

b) Implement a Beta version of the System with Unified Database, Development of Web-based Geoportal, Mobile Application and its Integration, Remote Sensing Data Automation.

c) Bathymetric survey report on biannual basis to quantify silt deposition.

d) Integration of google earth imagery API for time-series visualization.

e) Development and deployment modules on Staging System with reports on each individual module, including encroachment monitoring & removal workflow, water quality monitoring, water spread area, catchment characteristics for water holding capacity and de-siltation identification.

f) Development and deployment modules on Staging System with reports on each individual module for Urban Agglomeration Mapping & Monitoring such as landuse/landcover change, encroachment monitoring, ULB facilities and infrastructure, road networks, drainage networks, water supply networks, solid waste disposal facilities, compost waste dumping points, and green cover.

g) User Acceptance Deployment Report & GO Live of the Module, for above mentioned (Point e and f) applications.

h) Capacity Building & Training program.

i) Deployment of the System on UT Preferred Cloud Environment.

j)   Technical Support and Maintenance for 24 months after Go Live.

5.0 ELIGIBILITY CRITERIA

Below are the pre-qualification criteria that must be met by prospective IT and Remote sensing companies/consultancies/organizations/institutes:

a)   A minimum of **5 years** of experience and technical expertise in the field of Remote Sensing, GIS, Geospatial Modelling, Machine Learning, Artificial Intelligence, development of Web-based Geoportals, Geo-intelligent Mobile Apps, framing of planning and policy documentations, and experience in liaising with different government and non-government stakeholders in India.

b)   The organization must have at **least 2** successfully completed assignments on the automated real time mapping & monitoring of wetlands and urban areas with state-of-the-art technologies.

c)   Prior experience of working with Central and UT/State governments and/or nodal organization.

d)   A multidisciplinary team with minimum **10 years** of experience in the field of Remote Sensing & GIS, Machine Learning, Artificial Intelligence, Drone Survey and data processing, Geoportal Services, Mobile Application services

e)   The organization must not have been declared ineligible/banned/blacklisted by any State or Central Government/ any other Government Institution in India for any reason (as on the last date of submission of EOI) or convicted for economic offenses in India for any reason (as on the last date of EOI submission). A self-declaration in this regard must be submitted.

f)   The organization must have implemented two similar consultancy contracts of a minimum value of **INR 1 crore** each in the last 10 years. The organization shall submit a copy of evidence in support of this.

g)   The annual average turnover of the organization shall not be less than **INR 4 crore per annum** for the last 3 years.

h)   The organization must be (a) a company registered under Company Act 1956/2013; or (b) Society Registration Act 1860/Indian Trust Act 1882; or c) a government-recognized academic institution.

i)   Consortium of companies (not more than two) with proper documentation and authorization in favour of the principal company. The experience and annual turn-over **(a & g)** shall be considered from principal company only. Besides, the lead partner in the consortium must have a role of harboring more than 80% work.

j)   Must be registered with the GST Authority.

It should be noted that the prospective organizations must meet all the pre-qualification criteria mentioned above, and the documents submitted are subject to verification. A self-declaration must be submitted by the organization, stating that all the submitted documents are authentic. The shortlisting will be based on

the below selection procedure. The firms who shall secure the minimum of 75% marks shall be shortlisted for RFP.

6.0. SELECTION PROCEDURE

Sl.No	Criteria	Weightage	
	Sub-Criteria	Criteria Total	Sub-criteria
1	Past Experience of the Organization/consultant	60%	
	Number of years of relevant experience		20%
	Past experience in domain of Remote Sensing, GIS, Web development, Mobile Application Development, Machine Learning, Artificial Intelligence		50%
	Past Experience in carrying out Studies in similar sectors (wetlands & urban agglomerations)		20%
	Studies carried out in the region		10%
2	General Profile of qualification, experience and number of key staff (not individual CVs)	15%	
	Qualification		30%
	Relevant Experience		70%
3	Overall financial strength of the consultant in terms of turnover, profitability and cash flow Turn over, Net Profit etc.	15%	100%
4	Presentation (Technological Strengths/Advancement in Domain)	10%	100%

7.0 DOCUMENTATION TO BE SUBMITTED (Annexures)

The interested organization must furnish the following information while submitting their Expression of Interest (EOI) **(FORMAT 1)** to establish their compliance with the eligibility criteria:

a) A 10-page Organization Profile comprising of relevant brochures, project catalogues, organizational structure, top management or board of trustees, and number of personnel employed. (At this stage, CVs of relevant personnel are not required.) **(FORMAT 2)**

b) Experience in field of Remote Sensing & GIS, Geoportal & web development, Mobile application development, Machine Learning & Artificial Intelligence **(FORMAT 3)**

c) List of at least four experts/consultants on payroll **(FORMAT 4)**

d) Audited Financial Statements Turn-over (Balance Sheet and Profit & Loss accounts) for the last three years **(FORMAT 5)**

e) Certificate of Registration.

f) GST Registration/Payment Certificate issued by the competent authority.

g) A self-declaration certifying that the organization has not been banned, blacklisted, or declared ineligible by any Central or State Government or any other Government Institution in India, or convicted for economic offences in India on the last date of submission of the EOI.

h) Proper documentary proof and authorization in favour of the principal company for Consortium of companies (not more than three).

i) Evidence of having undertaken at least two consultancy contracts of similar nature not less than the amount of INR **1 Cr** each during the last 10 years.

j) All submitted documents must be attested by an authorized person of the Organization/Agency.

It is essential to note that the documents submitted are subject to verification, and the supplier must ensure the authenticity of all the submitted documents.

<div align="right">

Director,
Ecology, Environment & Remote Sensing,
J&K, Govt.
Jammu/Srinagar

</div>

ANNEXURES

FORMAT – 1
APPLICANT'S EXPRESSION OF INTEREST

To
Director,

I/210800/2023

Ecology, Environment & Remote Sensing,
J&K, Govt.
Jammu/Srinagar

Subject: Satellite and AI-based real time mapping and monitoring of wetlands & urban agglomeration of Bandipora district of Jammu and Kashmir

Dear Sir,
In response to the Invitation for Expressions of Interest (EoI) published for the above purpose, we would like to express interest to carry out the above proposed task. As instructed, we attach the following document as soft copy through email:

1. Organizational Details (Format-2)

2. Experience in related fields (Format-3)

3. List of at least four experts / consultants on payroll (Format-4)

4. Financial strength of the organization (Format-5)

5. Authorizing letter for signing the proposal.

We hereby declare that all the information and statements made are true.

Yours sincerely,
Authorized Signatory [In full and initials]:
Name and Title of Signatory:
Name of Organization:
Postal Address for communications
Telephone No.
Cell phone Number

Encl.: As above.
Note: This is to be furnished on the letter head of the organization.

FORMAT – 2

Sl. No	Organizational Details	
1	Name of Organization	
2	Main areas of business	
3	Type of Organization: Firm/ partnership/ proprietorship firm/ registered society/ Central or State Government undertaking/ corporate body/ company etc. registered under the relevant Act(s).	
4	Whether the firm has been blacklisted by any Central Govt. / State Govt./PSU/ Govt. Bodies / Autonomous? If yes, details thereof.	
5	Address of registered office with telephone no. & fax no.	
6	Contact Person with telephone no. & e-mail ID	

Encl.:-
 1. Copy of Certificate or other relevant documents, if any for Sl. No. 1, 2 and 3 above.

Signature of the applicant
Full name of the applicant
Stamp & Date

I/210800/2023

FORMAT – 3

Experience in Related Fields					
Overview of the past experience of the Organization in all aspects related to Remote Sensing, GIS, Web development, Mobile Application Development, Machine Learning, Artificial Intelligence					
Sl. No	Items	Number of Assignments	Total Experience in Years	Order Value of each assignment (Rs.)	Mention the name of Client / Organization (Enclose copy of each work order and completion certificates thereof)
1	A minimum of 5 years of experience and technical expertise in the field of Remote Sensing, GIS, Geospatial Modelling, Machine Learning, Artificial Intelligence, development of Web-based Geoportals, Geo-intelligent Mobile Apps, framing of planning and policy documentations, and experience in liaising with different government and non-government stakeholders in India.			1. 2. 3.	1. 2. 3. .. ..
2	Experience in carrying out similar assignments during last 5 years			1. 2. 3.	1. 2. 3. .. ..
3	Prior experience of working with Central and UT/State governments and nodal departments. Provide the full details of projects carried out			1. 2. 3.	1. 2. 3. ..
4	Team members having minimum 10 years of experience in the field of Remote Sensing & GIS, Machine Learning, Artificial Intelligence, Drone Survey and data processing, Geoportal Services, Mobile Application services.			1. 2. 3.	1. 2. 3. ..

5	At least 2 successfully completed assignments on the automated real time mapping & monitoring of wetlands and urban areas with state-of-the-art technologies.			1. 2. 3.	1. 2. 3. ..
	Decision of Director Ecology, Environment and Remote Sensing, J&K Government or any of it's designates in ascertaining "similar nature" and "similar assignment" should be final. Signature of the applicant Full name of applicant Stamp & Date				

FORMAT – 4

List of experts/consultants on payroll (at least 3)				
Sl. No	Name	Designation	Qualification	Relevant Experience
1				
2				
3				
4				
5				
6				

Signature of the applicant
Full name of applicant
Stamp & Date

FORMAT – 5

Financial Strength of the Organization					
Sl. No.	Financial Year	Whether profitable Yes/No	Annual net profit (Rs.)	Overall annual turnover (Rs.)	Annual turnover from only Consultancy services rendered in India (Rs.)
1	2019-20				
2	2021-22				
3	2022-23				
Note: Please enclose auditor's certificate in support of your claim.					

Signature of the applicant
Full name of applicant
Stamp & Date

Encl.: - 1. Copy of Income Tax Return for three financial year mentioned above.
2. PAN and GST papers.