GOVERNMENT OF INDIA
MINISTRY OF SCIENCE & TECHNOLOGY
DEPARTMENT OF SCIENCE & TECHNOLOGY
NATIONAL GEOSPATIAL PROGRAMME (NGP)
(erstwhile NRDMS)
dst.gov.in

Call for proposal for geospatial Technology and Solutions

The National Geospatial Programme (NGP) division, formerly NRDMS, has played a pioneering role in advancing geospatial science and technology. Its primary objective is to foster research and development in geospatial technologies and solutions, thereby promoting informed decision-making and driving sustainable socio-economic development across various sectors. Aligned with the vision and goals of the National Geospatial Policy 2022, NGP aims to position India as a global leader in the geospatial domain by promoting collaboration among stakeholders.

In accordance with its objectives, the NGP division is inviting proposals in the domain of Geospatial Technology and Solutions. The aim is to facilitate collaborative efforts among academia, startups/MSME/industry, and user-agencies/practitioners to develop innovative solutions that address key societal challenges. This initiative will operate in a consortium mode, emphasizing interdisciplinary collaboration with focus areas including agriculture, water resources, urban planning, environment, healthcare, spatial data risk reduction and logistics. The goal is to create impactful solutions by applying geospatial technologies, thereby strengthening the geospatial ecosystem and thus stimulating long term socio-economic growth of the country.

More details about the call (Information Brochure and format etc.) can be found on https://onlinedst.gov.in/. Last date for submission online proposals is 15th July, 2024.

भारत सरकार
विज्ञान और प्रौद्योगिकी विभाग
विज्ञान और प्रौद्योगिकी मंत्रालय
राष्ट्रीय भू-स्थानिक कार्यक्रम (एन. जी. पी.)
(पूर्ववर्ती एन. आर. डी. एम. एस.)
dst.gov.in

भू-स्थानिक प्रौद्योगिकियों और समाधानों के लिए प्रस्ताव का आह्वान।

राष्ट्रीय भू-स्थानिक कार्यक्रम (एन. जी. पी.) प्रभाग, जिसे पहले एन. आर. डी. एम. एस. कहा जाता था, ने भू-स्थानिक विज्ञान और प्रौद्योगिकी को आगे बढ़ाने में अग्रणी भूमिका निभाई है। इसका प्राथमिक उद्देश्य भू-स्थानिक प्रौद्योगिकियों और समाधानों में अनुसंधान और विकास को बढ़ावा देना है, जिससे सूचित निर्णय लेने को बढ़ावा मिलता है और विभिन्न क्षेत्रों में सतत सामाजिक-आर्थिक विकास को बढ़ावा मिलता है। राष्ट्रीय भू-स्थानिक नीति 2022 के दृष्टिकोण और लक्ष्यों के साथ संरेखित, एन. जी. पी. का उद्देश्य हितधारकों के बीच सहयोग को बढ़ावा देकर भारत को भू-स्थानिक क्षेत्र में एक वैश्विक नेता के रूप में स्थापित करना है।

अपने उद्देश्यों के अनुसार, एन. जी. पी. प्रभाग भू-स्थानिक प्रौद्योगिकी और समाधान के क्षेत्र में प्रस्ताव आमंत्रित कर रहा है। इसका उद्देश्य प्रमुख सामाजिक चुनौतियों का समाधान करने वाले नवीन समाधान विकसित करने के लिए शिक्षाविदों, स्टार्टअप / एम एस एम ई/ उद्योग और उपयोगकर्ता एजेंसी/ व्यवसायियों के बीच सहयोगात्मक प्रयासों को सुविधाजनक बनाना। यह पहल एक संघ प्रणाली में काम करेगी, जिसमें कृषि, जल संसाधन, शहरी नियोजन, पर्यावरण, स्वास्थ्य सेवा, स्थानिक डेटा द्वारा जोखिम में कमी और संभार-तंत्र के साथ अंतःविषय सहयोग पर जोर दिया जाएगा। । इसका लक्ष्य भू-स्थानिक प्रौद्योगिकियों को उपयोग करके प्रभावी समाधान तैयार करना है, जिससे भू-स्थानिक पारिस्थितिकी तंत्र को मजबूत किया जा सके और इस प्रकार देश के दीर्घकालिक सामाजिक-आर्थिक विकास को प्रोत्साहित किया जा सके।

इसके बारे में अधिक जानकारी (सूचना विवरणिका और प्रारूप आदि) https://onlinedst.gov.in/ पर पाई जा सकती है। ऑनलाइन प्रस्ताव जमा करने की अंतिम तिथि 15 जुलाई, 2024 है।

GOVERNMENT OF INDIA

MINISTRY OF SCIENCE & TECHNOLOGY
DEPARTMENT OF SCIENCE & TECHNOLOGY
NATIONAL GEOSPATIAL PROGRAMME (NGP) DIVISION
https://dst.gov.in/national-geospatial-programme-division-erstwhile-nrdms

Call for proposal in Geospatial Technology and Solutions

*Application format is at **Annexure-I***

Introduction

The Department of Science and Technology, through its National Geospatial Programme (formerly NRDMS), initiated in 1982, has been at the forefront of interdisciplinary research, promoting R&D in emerging areas of Geospatial Science and Technology. It has provided geospatial solutions to address area-specific challenges, showcasing the applications of Geospatial Technologies in decision-making processes. Now known as the National Geospatial Programme (NGP), its vision encompasses advancing science and technology, influencing policy, providing solutions, enhancing capacity, fostering entrepreneurship, and encouraging international collaboration for sustainable socio-economic development across governance levels.

Purpose of this call

This call aims to strengthen the country's geospatial technological capabilities and enhance the development of Geospatial Technology and Solutions across various sectors. The goal is to create impactful solutions that address grassroots-level issues and realize the vision of establishing a robust geospatial ecosystem.

The department invites proposals in consortium mode, comprising academia, startups/MSMEs/industry, and user-agencies/practitioners. The focus lies on Geospatial Technology and Solutions, emphasizing the creation of technological solutions tailored to specific domain problems, to be realized through productionization or implementation.

The overarching goal of this call is to strategically contribute to the development of impactful geospatial technology and solutions, ultimately strengthening the geospatial landscape within the country.

Key focus areas: Geospatial Technology and Solutions

(Note: The below-mentioned focus areas are ONLY indicative. The objective of the call is to support real life use cases developed or to be developed for providing ground level solutions for possible commercialization. Proposals to be submitted ONLY in consortia with academia, start-up/ MSME/ Industry and user-agencies/ practitioners)

1. **Agriculture:**

- Monitoring techniques leveraging machine learning and deep learning algorithms utilizing cutting-edge technologies such as Polarimetric Interferometric SAR (Pol-InSAR), Tomographic SAR (Tomo-SAR), and SAR + Multi/Hyperspectral datasets

for tasks including classification, biomass estimation, crop health analysis, yield estimation, and climate risk analysis.

- Smart agriculture incorporating IoT, mobile apps, digital twins, Artificial Intelligence (Machine and Deep Learning for Computer Vision) and other emerging technologies for applications such as geo-referenced crop disease & health prediction aiding improved agricultural productivity.

- Utilizing geospatial data for near real time cropland extent, crop health cycle and other Land Use Land Cover (LULC) analysis to understand agricultural production patterns and enabling informed decision and policy making for food and water security.

2. Urban Planning & Rural Development:
- Smart city management models with a focus on real-time actionable information and predictive maintenance employing deep learning algorithms for analysis, leveraging photogrammetry (LOD-4 & LOD-5 for buildings), GIS, drone imagery, and LiDAR data.

- Use of Building Information Modelling (BIM) and Digital Twins to optimize infrastructure management as well as indoor spatial intelligence.

- Integration of sensors and other IoT device outputs for mapping of real time conditions prevailing at the city level and near time predictions.

- Modelling and creation of digital twins for effective urban planning and archaeological structures and subsurface sites.

- Pilot/PoC to demonstrate quick plot survey through drone assisted high resolution cameras and LiDARS (Light Detection and Ranging Sensors), matching of high-resolution satellite and aerial imagery, using high-precision GNSS (Global Navigation Satellite System) receivers for "walk and record" boundary lines, with standardized protocols. And subsequently post-processing to generate 3D models, ortho-mosaics, contour maps, extracting relevant features for creating detailed maps from matched satellite and aerial imagery. Additionally, use of error correction algorithms to enhance data accuracy and reliability.

- Combining IDDM (Interferometric Digital Detection Method) imaging with laser-equipped drones provides high-resolution (1 cm), high-accuracy (5 cm) topographic data for creating accurate digital elevation models (DEMs) and 3D maps.

- Real time processing of aerial images and feature extraction through on platform distributed computational power and federated learning.

- Combining high quality scalable vector mapping systems with directional engines for enhancing optimal routing solutions and navigational accuracy.

3. Environment, Forest & Ecology:
- Forest phenology characterization and forest-fire mapping utilizing machine/deep learning algorithms.

- Environmental management with a focus on monitoring of air and water quality, carbon emissions, and source apportionment.

- Habitat conservation and biodiversity management through the implementation of digital twins.

4. Water & Oceanic Resources:

- Groundwater quality assessment and mapping using Stable isotope tracers.
- Comprehensive mapping and monitoring of coastal and river habitats. Utilization of AI/ML/DL for water pollution mapping, infrastructure development mapping, and forecasting potential fishing (Oceansat 2).
- Assess potential for seaweed, sea grass growth, and aquaculture zones in non-developmental areas (CRZ III), considering impacts from storm surges, sea level rise, and saltwater intrusion.
- Leverage remote sensing data to create digital twins and track Microplastic circulation in oceans, including source identification through stable isotopes. Location identification for sampling to study ocean nutrient cycling mechanism, carbon and oxygen exchange, and model food web dynamics using stable isotope analysis.

5. Healthcare:

- Health resource repository and map a health stack for effective health emergency planning and optimal resource utilization aiming to enhance public health preparedness, response, and management through advanced geospatial technologies.
- Disease spread prediction models to provide early warnings of outbreaks, conduct source analysis, and assess intervention effectiveness.
- Personalized health recommendations utilizing mobile health metrics data.
- Facilitating critical health deliveries such as medicines, organ transportation, and patient ambulance services during emergencies and trauma situations.

6. Geospatial Infrastructure:

- Data Cubes for enabling ease of storage, retrieval and analysis of big and complex earth observation (EO) data.
- Post-processing of CORS station data using software like Bernese/GAMIT, post processing of IRNSS data, integrating virtual RINEX, and smartphone-based GNSS positioning.
- Deriving parameters such as Integrated Perceptible Water Vapour (IPWV), Total Electron Count (TEC), and slanting wet delay (SWD) in real-time from GNSS observations.
- Utilizing AI and big data tools, including Hadoop, Spark, and NoSQL, for supporting the development of an advanced hyper-converged infrastructure for handling and deriving analytics out of Geospatial data as well as Mobile apps and open APIs to democratize geospatial data availability.
- Pilot/PoC of implantation of Standards for mobile indoor location applications, exemplified by InDoorGML.
- Implement indoor distance measurement and location approximation using WiFi/LiFi/Bluetooth/UWB and create 3D maps through LiDAR.
- Using Mapping Machine for real-time population scale editing of infrastructure maps, supporting efficient infrastructure management and maintenance.
- Developing systems with augmentation of low power, high sensitivity (LP-HS) chips with Extended Kalman Filter (EKF) and Micro Electro Mechanical System (MEMS) Gyroscopes on it, with the latest Navigation with Indian Constellation (NavIC III) for most accurate navigation and positioning.

- Integrating quantum technologies with Navigation with Indian Constellation (NavIC III) to achieve lower latency in sensing and positioning through quantum entanglement and superposition, while ensuring secure signal transmission between ground systems and satellites via quantum key distribution (QKD) encryption.
- Pilot/PoC for use of Pseudolites (pseudo-satellites) to extend GNSS (Global Navigation Satellite System) coverage to areas with poor satellite visibility, improving positioning reliability and accuracy.
- Integrating technologies such as IDDM (Interferometric Digital Detection Method) and extend GNSS (Global Navigation Satellite System) for precision positioning which is useful in civil and military applications.
- Real time creation of outdoor digital twins through satellite, imagery and GNSS (Global Navigation Satellite System) data and indoor digital twins through 3D LiDAR scanning and Indoor Positioning Systems (IPS) technologies such Wi-Fi, Bluetooth, or ultra-wideband (UWB) along with integration of Internet of Things (IoT) sensors for real time information availability and use of hybrid deterministic/stochastic simulation models such as Physics Informed Neural Network (PINN) and Deterministic Generative AI (DeGenAI) for simulation .

7. Spatial Data Risk Reduction:
- Thematic real-time risk mapping and early warning systems for various natural and anthropogenic hazards, including slope failures, landslides, earthquakes, floods, cyclones, tsunami, mining disasters, GLOFs, LLOFs, drought, and various environmental hazards as well as hazard mapping, and digital twins for post-disaster loss assessment using machine learning and deep learning algorithms on data sources such as Differential Interferometry or high-resolution SAR data (Persistent Scatterer Interferometry) for landslide prediction, LiDAR and drone data.
- Mitigation resource mapping to aid disaster management, rehabilitation efforts, and future preparedness and planning.

8. Logistics & Transportation:

- Applications for transportation networks enhancement through route optimization, precise traffic congestion monitoring, and real-time tracking of transport vehicles.
- Leveraging geocoded data with centimetre-level accuracy and NAVIC's integration with drone and robot-enabled delivery systems for improving last-mile delivery operations, especially in densely populated urban areas and remote rural regions.
- Pilot/ POC of Geospatial Network Traversal Engine to optimize transportation network and spatial data analytics for better infrastructure planning.
- Pilot/ POC of India address standards which would ensure 99.999% (near-perfect) reachability using mobile phones and GNSS being language agnostic and accessible to population of all literacy levels.
- Efficient route planning using real-time tracking of vehicles using Navigation with Indian Constellation (NavIC)'s positioning and timing services.
- Applications using NAVIC Leapfrog's superior accuracy and resilience against jamming.

- Application of CAT III B (semi-automated allowing landing with runway visual range of 75 meters) and C (fully automated allowing landing with runway visual range of 0 meters) systems for aiding landing of aircrafts (especially in low/no visibility conditions) through GNSS (Global Navigation Satellite System) data cross verified with data from Navigation with Indian Constellation (NavIC) and satellite navigation systems Galileo (Europe) and GPS III/IV (USA) along with ground based pseudolites and advanced core chip on the aircraft for real time processing of these inputs.

Who can submit the proposal? / Eligibility Criteria:

The proposal should be submitted in consortium mode involving not more than four parties, ensuring at least one member each from academia*, startups/ MSMEs/ industry and user-agencies/practitioners. Proposals with TRL 3 and above levels shall be accorded weightage at the screening stage.

*Faculty members, scientists, engineers, technologists in permanent positions working in UGC recognized universities, national institutions of research and research management etc. having requisite qualification in the geospatial domain.
The PIs/ start-ups/ MSMEs/ Industry shall have sufficient experience in this field evidenced by published books/ papers, project handled/ field experience etc.

Roles and Responsibilities of academia, startups/ MSMEs/ industry and user-agencies/practitioners within the consortium

- Academia:

    1. Project Management: Oversee the academic aspects of the project, including timelines, deliverables, and reporting etc. and manage the flow of funds (described in the next section below). The academia would be responsible for submission of the proposal after collating the required information from other members of the consortium. Academia being the nodal body within the consortium it is expected to provide appropriate handholding to other members of the consortium as needed to reach the final outcome.
    2. Research and Development: Conduct research to develop innovative Geospatial Technology and Solutions.
    3. Providing Technical Expertise and support: Provide expertise in geospatial science, technology, and data analysis as well as providing access to research infrastructure to the startups/ MSMEs/ industry and user-agencies/practitioners.
    4. Capacity Building: Train consortium members on relevant skills and technologies.
    5. Documentation: Document the research findings, methodologies, and outcomes for dissemination and future reference and for giving a timely report of progress to DST.
- 2. Industry/MSME/Startups:

1. Technology Development: Develop and implement Geospatial Technology and Solutions based on academic research and user requirements.
2. Productization: Transform research outcomes into marketable products or services.
3. Commercialization: Explore opportunities for commercialization and market penetration of developed solutions.
4. Quality Assurance & Risk Management: Ensure the quality, reliability, and scalability of developed products or services while ensuring mitigation of risks associated with technology development and commercialization.

3. User Agencies/Practitioners:

   1. Requirement Identification: Define specific Geospatial Technology requirements and problem statements.
   2. Feedback and Validation: Provide feedback on developed solutions and validate their relevance and effectiveness in addressing real-world challenges.
   3. Integration: Integrate developed solutions into existing workflows, systems, or processes.
   4. User Training: Train end-users on the use of developed Geospatial Technology solutions.
   5. Solution Endorsement: Endorse and promote the adoption of successful solutions within their respective domains or sectors.

Flow of funds within the consortium

- Academia: Will receive funds from DST and will disburse them to support the activities of industry/MSME/startups and user agencies/practitioners within the consortium. It will manage the financial transactions, including budget allocation, expenditure tracking, and financial reporting. Ensuring transparency and compliance as per the DST guidelines will be paramount. Academia shall be responsible for submitting consolidated financial documents and project reports (Statement of Expenditure (SoE), Utilization Certificate (UC) etc.) on behalf of the consortium at regular intervals and as asked by the DST.

- Industry/MSME/Startups: The academia will manage and coordinate the utilization of funds, ensuring alignment with project objectives and equitable distribution among consortium members. Industry may extend support in kind, such as providing resources, expertise, or infrastructure, which can be considered as part of the overall funding from the industry, which will be managed by academia through specific agreements signed between the parties.

- User Agencies/Practitioners: The academia will ensure that the needs and requirements of user agencies/practitioners are addressed effectively for user trainings and solution endorsements by support from the industry as part of the consortium mechanism. These agencies would benefit from the Geospatial Technology and Solutions developed

within the consortium while symbiotically benefitting industry/MSME/startups by giving quick feedback for market readiness of the solutions developed.

IPR in Consortium Mode:

The primary objective of the Call for Proposals is to foster the development of solutions using geospatial technologies to address pertinent challenges within the country. To ensure effective collaboration and fair distribution of intellectual property rights (IPR), the following guidelines apply:

IPR Ownership Categorization:

- **Existing IPs:** These are intellectual properties owned by the party who originally acquired, obtained, or developed them. They may include patents, copyrights, trademarks, and other forms of intellectual property.
- **New IPs:** These are intellectual properties generated during the consortium project, arising from collaborative research, development, and innovation efforts. In case of any dispute regarding the classification of IP as existing or new, the burden of proof lies with the party claiming it as 'existing.'

Ownership of New IP:

- The ownership of intellectual property generated within the consortium shall be as per the agreement between the members of the consortium in accordance with the rules and guidelines of each member. The indicative guidelines are as outlined below:
  - **Academia:** Ownership of new IP generated through academic research activities typically vests with the academic institution or researcher leading the project.
  - **Startups/MSMEs/Industry:** Ownership of new IP resulting from technology development and commercialization activities generally belongs to the startup, MSME, or industry partner directly involved in those efforts.
  - **User Agencies/Practitioners:** Ownership of new IP stemming from user agency or practitioner involvement may vary based on contractual agreements and specific project arrangements.

IP Utilization:

- The utilization of intellectual property within the consortium involves commercial transactions and collaborative agreements among the consortium parties. Each consortium member is granted the first right of refusal for any new intellectual property developed during the project, based on their respective roles and contributions.
- Licensing arrangements for new IP, particularly when it is dependent on existing IP of another party, can be negotiated among consortium members. Costs associated with licensing agreements are typically borne by the interested party seeking access to the intellectual property.

Implementation Duration:

The proposal will be supported initially for a duration of two years which may be extended based upon the requirement and progress assessed by Expert Committee.

In the initial phase, DST will play a significant role in providing financial support for the implementation of Geospatial Technology and Solutions through the consortium. However, as projects advance and demonstrate feasibility and potential for scalability, industry/MSME/startups support shall progressively increase. By strategically aligning project milestones with the shifting dynamics of funding contributions, the consortium needs to ensure a smooth transition towards greater industry and practitioner support, thereby fostering sustainability and long-term viability of the Geospatial Technology and Solutions.

How to submit the proposal?

The proposals should be submitted as a single pdf document at https://onlinedst.gov.in/ in proper format as provided at https://onlinedst.gov.in/ and duly forwarded by Head of the Institution/ University. Non-governmental organization (Deemed and private universities and research and development organization) should be registered at the https://ngodarpan.gov.in portal of the Government of India before submission of the proposal.

For any other query and submission of proposal please contact:

Dr. Shubha Pandey, Scientist-E / Mr. Ankur Mehta, Scientist-B
NGP Division (erstwhile NRDMS),
Department of Science & Technology,
Technology Bhavan, New Mehrauli Road,
New Delhi-110016 (Telefax: 011-26512514; 26590351)
Email: shubha.p@nic.in, ankur.mehta92@gov.in
NOTE: The e-version of the proposal duly endorsed from Head of the organisation should be submitted as a single pdf document at https://onlinedst.gov.in/

Annexure-I

The Geospatial Technology and Solutions & Technology project proposal (softcopy) in proper format following the guidelines and duly forwarded by Head of the Institute / University should be submitted ONLINE at https://onlinedst.gov.in/. Non-governmental organizations (Deemed and private universities and research & development organization) must register at ngodarpan.gov.in before submitting the proposals. The proposal has to be submitted by the academia only after gathering required details from other members of the consortium. Last date of submission is 15th July 2024.

PART 1.0 (General Information)

1.1   **Project title**   :

1.2   **Project Category**   :   **Geospatial Technology and Solutions**

1.2   **Priority area and sub-area** :

                                  1) Agriculture

                                  2) Urban Planning & Rural Development

                                  3) Environment, Forest & Ecology

                                  4) Water & Oceanic Resources

                                  5) Healthcare

                                  6) Geospatial Infrastructure

                                  7) Spatial Data Risk Reduction

                                  8) Logistics & Transportation

                                  9) Other (Please Specify)

1.3   Duration (in months)   :

1.4   Total cost   :

1.5   FE (Foreign Expenditure) component:

Sr. No.	Foreign Expenditure component of the project (in INR)	Foreign Expenditure component of the project as percentage of the total budget	Details of expected expenditure	Timeline of expected expenditure

1.6   Please Select the type within the consortium: Academia

(Freeze it)

1.7   Outline of the Proposal   :

(Not in more than 2500 words)

1.8   Gap areas to be addressed in the context of focus areas:

1.9   Uniqueness/Innovativeness /Novelty of the project:

1.10   Objectives of the Proposal :

(Precise & Quantified)

1.11   Methodology   :

(Detailed methodology to implement the project)

1.12   Deliverables   :

(Define your own deliverables, as the end outcome of your project proposal, i.e., Product/service details/Technology Developed)

PART 2.0 (Consortium details)

2.1 Details of Academia

2.1.1. Type of Institute: 1) Educational Institute

2) Autonomous Research Institute

2.1.2. Principal Investigator:

2.1.3. Co-Principal Investigators:

2.1.4. Designation:

2.1.5. Category: 1) General

2) SC

3) ST

4) OBC

2.1.6. Date of Birth:

(In DD/MM/YYYY Format)

2.1.7.: Gender 1) Male

2) Female

3) Others

2.1.8. Telephone, Fax:

2.1.9. Department & Institution Name:

2.1.10. Institution Type: 1) Govt

2) Private

2.1.11. Address:

2.1.12. Specialists Consulted or Likely to be Consulted:

Sr. No.	Name	Designation	Affiliation
1.			
2.			
3.			

(List of three experts in the area where project proposal can be sent for reviewing)

2.1.13. Research Focus/Area of Expertise:

2.1.14. Previous Research Experience in Geospatial Technologies:

Sr. No.	Project Title and short description	Funding Agency	Project duration		Outcomes
			From DD/MM/YYYY	**To** DD/MM/YYYY	
1.					
2.					
3.					

2.1.15. Relevant Publications:

2.1.16. Research Facilities/Infrastructure Available:

2.1.17. Budget Requirements:

2.1.18. Expected Outcomes/Impact:

2.1.19. Collaboration with Other Departments/Institutes:

Sr. No.	Details of Collaboration	Designation	Affiliation
1.			
2.			
3.			

2.1.20. Interdisciplinary Approach Projects undertaken and their progress especially in geospatial technologies in the last 5 years. Give year wise data:

Sr. No.	Project Title and short description	Funding Agency	Project duration		Outcomes
			From DD/MM/YYYY	**To** DD/MM/YYYY	
1.					
2.					
3.					

2.1.21. Integration of Geospatial Technologies with Domain Expertise:

2.1.22. Ethical Considerations/Compliances followed by the institutes in projects:

2.1.23. Socio-Economic Impact of Projects undertaken and their progress especially in geospatial technologies in the last 5 years. Give project wise data:

Sr. No.	Project Title and short description	Funding Agency	Project duration		Socio-Economic impact (give quantitative details along with region of impact)	Progress achieved in Geospatial technologies (give both qualitative and quantitative details)
			From DD/MM/YYYY	**To** DD/MM/YYYY		
1.						
2.						
3.						

2.1.24. Data Management Infrastructure at the Institute:

2.1.25. Dissemination and Knowledge Transfer Plan for Projects undertaken in the last 5 years. Give project wise data:

Sr. No.	Project Title and short description	Funding Agency	Project duration		Knowledge transfer & dissemination plan (point wise along with timelines)	Progress achieved in Geospatial technologies (give both qualitative and quantitative details)
			From DD/MM/YYYY	**To** DD/MM/YYYY		
1.						
2.						
3.						

2.2. Details of Start-ups/ MSME/ Industry

2.2.1. Organization Name and Contact Information:

2.2.1.1. Contact Person:

2.2.1.2. Email:

2.2.1.3. Phone:

2.2.2. Registration Details:

2.2.2.1. Legal Name of Organization:

2.2.2.2. Registration Number:

2.2.2.3. Date of Registration:

2.2.2.4. Registered Address:

2.2.3. Nature of Business:

2.2.3.1. Brief Description:

2.2.3.2. Area of Specialization:

2.2.4. Team Composition:

2.2.4.1. Principal Investigator:

2.2.4.2. Co-Principal Investigators:

2.2.4.3. Research Team Members:

2.2.5. Past Projects (descriptions of all projects):

Sr. No.	Project Title and short description	Funding Agency	Project duration		Outcomes
			From **DD/MM/YYYY**	**To** **DD/MM/YYYY**	
1.					
2.					
3.					

2.2.6. Technological Expertise:

2.2.6.1. Description:

2.2.6.2. Relevant Technologies:

2.2.6.3. Experience with Geospatial Technologies:

2.2.7. Infrastructure (individual and shared):

Sr. No.	Description of Facilities	Laboratory/Equipment	Scale of Facilities (give quantitative information)

2.2.8. Collaborative Experience:

2.2.8.1. Previous Collaborations:

2.2.8.2. MoUs/Agreement Copies:

(can be attached as a pdf document)

2.2.9. Financial Details:

2.2.9.1. Audited Reports (last 3 years as a single document):

(can be attached as a pdf document)

2.2.9.2. Verifiable Registration Details by Registrar of Companies in India:

2.2.9.3. Details of recent meeting of Board of Directors:

2.2.10. Commitment to Consortium:

2.2.10.1. Agreement to Collaborate:

2.2.10.2. Willingness to Contribute Resources:

2.2.11. Commercialization Strategy for the solution developed:

2.2.11.1. Description:

2.2.11.2. Market Analysis Plan:

(can be attached as a pdf document)

2.2.11.3. Sales/Marketing Plan:

2.2.12. Intellectual Property Rights (IPR):

2.2.12.1. Patents (if any). Give year wise details:

2.2.12.2. IPR Management Plan:

(can be attached as a pdf document)

2.2.13. Innovation Experience (if applicable):

2.2.13.1. Description:

2.2.13.1. Technology Readiness Level (TRL) achieved:

1) **TRL 1: Basic Principles (Observed)**

2) **TRL 2: Technology Concept (Formulated)**

3) **TRL 3: Experimental Proof (of Concept)**

4) **TRL 4: Technology Validation (in Lab)**

5) **TRL 5: Technology Validation (in Relevant Environment)**

6) **TRL 6: Technology Demonstration (in Relevant Environment)**

7) **TRL 7: System Prototype (Demonstrated in Operational Environment)**

8) **TRL 8: System Complete (and Qualified)**

9) **TRL 9: Actual System (Proven in Operational Environment)**

2.3. Details of User-agencies/ Practitioners

2.3.1. Name and Contact Information of User-agency/Practitioner:

2.3.2. Expertise & Specialization:

2.3.3. Accreditation (if applicable):

2.3.4. Scope of Work to be undertaken as part of consortium:

2.3.5. Previous Projects:

2.3.6. Authority for issuing certification (if applicable):

2.3.7. Certification Status:

2.3.8. Testing Facilities (if applicable):

2.3.9. Patents (if any):

2.3.10. Collaborations with Academia/Research Institutes:

2.3.11. MoUs/Agreement:

(can be attached as a pdf document)

2.3.12. Audited Reports (last 3 years as a single document):

(can be attached as a pdf document)

2.3.13. Legal Documentation (if applicable):

2.3.14. Project Budget Allocation:

2.3.15. Project Timeline:

2.3.16. Proposed Methodology/Approach:

2.3.17. Resource Requirements:

2.3.18. Data Sources/Availability:

2.3.19. Ethical Considerations:

2.3.20. Risk Management Strategy:

2.3.21. Innovation and Impact Assessment:

2.3.22. Sustainability Plan:

2.3.23. Dissemination Plan:

2.3.24. Monitoring and Evaluation Framework:

PART 3.0 (Work Plans)

3.1   Work Plan:

Sr. No.	Activity /Milestone	1st Year		2nd Year		3rd Year	
		1-6 M	6-12 M	13-18 M	19-24 M	25-30 M	31-36 M
1	*Activity 1**	*Milestones**					
2	*Activity 2*						

* Mention activities & Milestones clearly in terms of the timelines.

3.2   Detailed Work Plan List of Pathways for which a particular member of consortium is leading the implementation

Sr. No.	Pathway	Leading Consortium Partner	Start Date	End Date	Major Tasks
1	*Pathway-1 (P-1)*	*Academia or Start-ups/ MSME/ Industry or User-agencies/ Practitioners*			
2					

* A Pathway (P) includes various tasks being handled by various partners, coordinated by the Leading partner

Details of Pathway-1 (P-1)

Sr. No.	Major Tasks	Sr.No.	Deliverables	Responsible Consortium Partner Agency	Start Date	End Date
1	*Task 1 (T-1)*	*1*	*Deliverable 1(D-1)*	*Academia or Start-ups/MSME/ Industry or User-agencies/ Practitioners*		
		2	*Deliverable 2(D-2)*	*Academia or Start-ups/MSME/ Industry or User-agencies/ Practitioners*		
		3	*Deliverable 3(D-3)*	*Academia or Start-ups/MSME/ Industry or User-agencies/ Practitioners*		

*For each pathway there needs to be a table of tasks and its corresponding deliverables

PART 4.0 (Other Relevant Information)

4.1.   Technology Readiness Level (TRL) of proposed solutions or technology to be developed:

   1) TRL 1: Basic Principles (Observed)

   2) TRL 2: Technology Concept (Formulated)

   3) TRL 3: Experimental Proof (of Concept)

   4) TRL 4: Technology Validation (in Lab)

   5) TRL 5: Technology Validation (in Relevant Environment)

   6) TRL 6: Technology Demonstration (in Relevant Environment)

   7) TRL 7: System Prototype (Demonstrated in Operational Environment)

   8) TRL 8: System Complete (and Qualified)

   9) TRL 9: Actual System (Proven in Operational Environment)

4.2.   Suggestions for forward-chaining of the research outcomes:

4.3.   Risks & Challenges:

4.4.   Years of Experience in Geospatial Technology and Solutions Development (Supported by evidence viz. Patents/Publications/Assignments/Projects etc):

4.5.   Any other information relevant to the Project proposal/ execution of the project (Importance of the proposed Technology Development via R & D to India, Group strength, site details, economic analysis, Institutional Details etc. In case of Geospatial Solutions Development and in case of consortium with a private sector company, please indicate the plan of commercialization of the product/process/technology development under the project)

4.6.   In case the proposal is recommended by the Expert Committee (EC) then the details of the Zero Balanced Subsidy Accounts (ZBSA) account for the INNOVATION, TECHNOLOGY DEVELOPMENT & DEPLOYMENT [1819 Scheme] under the Central Nodal Agency (CAN) System would need to be submitted.

4.7.   Budget estimates (mapped on the proposed activities and must provide justification of Each Budget Heads):

Sl.no.	Item	Year 1 Amount (Rs.)	Year 2 Amount (Rs.)
	Budget for Hardware and software (non-recurring)		
	Budget for Manpower/ salaries/ wages		
	Budget for consumable materials		
	Budget for travel		
	Budget for miscellaneous costs:		
	Institute Overhead (10-8 % of the total)		

4.8.   Biodata of investigators and co-investigators:

i. NAME**:**

ii. DATE OF BIRTH**:**

iii. Full address, email and other contact details

iv**.** ACADEMIC   QUALIFICATIONS **(**Research Publications and other important achievements in the proposed area**.** List of relevant work done in the past and research publications)**:**

4.9. **Names and addresses of experts / institutions interested in the subject / outcome:**

i**.** NAME**:**

ii**.** Full address, email and other contact details

4.10. ENDORSEMENT FROM THE HEAD OF INSTITUTION

PROJECT TITLE:

Certified that the Institute welcomes participation of Dr............as the Principal Investigator for the project.

1. Certified that the equipment other basic facilities and such other administrative facilities as per terms and conditions of the grant will be extended to the investigator throughout the duration of project.

2. Institute assumes the financial and other management responsibilities of the project.

<div align="right">Name and Signature of Head of Institution</div>

Date

Place:

In regard to the research proposals emanating from scientific institutions/laboratories under various scientific departments the Head of the institution is required to provide a justification indicating clearly whether the research proposal falls in line with the normal research activities of the institution or not.

CERTIFICATE FROM THE INVESTIGATOR/ CO-INVESTIGATOR

PROJECT Title:

1. I/We agree to abide by the terms and conditions of the DST grant.

2. I/We did not submit this or a similar project proposal elsewhere for financial support.

3. I/we have explored and ensured that equipment and basic facilities will actually be available as and when required for the purpose of the project. I/We shall not request financial support under this project for procedure for procurement of these items.

4. I/We undertake that spare time on permanent equipment. (listed in section 15.2) will be made available to other users.

5. I/We undertake to submit progress reports statement of accounts, utilisation certificates etc., regularly as prescribed by DST.

6. I/We have enclosed the following materials:

Items	No. of copies

a. Endorsement from the head of the

  Institution (on letter head)   one

b. Certificate from Investigator (s)   one

c. Name (s) and address (es) of experts/

   institutions interested in the subject/outcome   Three

                                        Name and signature of investigator/ and Co-investigator

Date:

Place:

CERTIFICATE OF COMMITMENT - STARTUPS/MSME/INDUSTRY

[LETTERHEAD OF STARTUP/MSME/INDUSTRY]

I, [Name of Head of Startup/MSME/Industry], hereby certify that [Name of Startup/MSME/Industry] is committed to participating in the consortium for the proposal titled "[Title of Proposal]". I acknowledge and agree that the flow of funds for the project shall be through academia.

As the head of [Name of Startup/MSME/Industry], I pledge my organization's commitment to providing the following resources to the consortium:

- Technological expertise in [Specific Technology/Area]
- Access to proprietary data or software specific to the proposed project
- In kind support for project-related expenses

Additionally, we commit to the following timeline for the project:

- Provision of required resources from [Start Date] to [End Date]
- Demonstration of project progress by [Date]
- Finalization of project deliverables by [Date]

[Signature]

[Name of Head of Startup/MSME/Industry]

[Title/Position]

[Date]

[Official Seal of the Startup/MSME/Industry]

CERTIFICATE OF COMMITMENT - USER-AGENCIES/PRACTITIONERS

[LETTERHEAD OF USER-AGENCY/PRACTITIONER]

I, [Name of Head of User-Agency/Practitioner], hereby certify that [Name of User-Agency/Practitioner] is committed to participating in the consortium for the proposal titled "[Title of Proposal]". We acknowledge and agree to contribute to the consortium's objectives and efforts.

- As the head of [Name of User-Agency/Practitioner], I confirm our commitment to providing the following resources to the consortium, pertaining to the proposed project only:
- Domain-specific knowledge and expertise
- Access to relevant data or field sites
- In kind Support for field testing and validation

Furthermore, we commit to the following timeline for the project:

- Provision of required resources by [Start Date]
- Participation in project meetings and reviews
- Feedback and input on project progress at key milestones

[Signature]

[Name of Head of User-Agency/Practitioner]

[Title/Position]

[Date]

[Official Seal of the User-Agency/Practitioner]