



Maldives Land and Survey Authority

Ministry of National Planning, Housing and Infrastructure
Male', Republic of Maldives.

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Terms of Reference (TOR)

Consultation Service

Establish of Land Information System (LIS)

Build Capacity and Mainstream Sustainable Land Management in the Maldives

Maldives Land Survey Authority

Ministry of National Planning, Housing & Infrastructure

Project Background

The Republic of Maldives is a Small Island Developing State (SIDS) that faces development challenges such as land scarcity, vulnerability to climate, economic development problems due to high transportation costs, lack of adequate infrastructure and lack of industrial development incentives. The Maldives is an archipelago comprised of 1,200 coral islands in 26 geographic atolls over an area of about 750 km on a North-south axis and 120 km (about 74.56 mi) on an east-west axis. The land area of the Maldives accounts for about 1% of the Country's territory. The Maldives islands are low lying land areas with an average height above sea level of 1.8 meters (m). The country's population of 400,000 is dispersed across 187 inhabited islands. An additional 166 islands have been developed as tourist resorts.

The Maldives Land and Survey Authority (MLSA) under the Ministry of National Planning, Housing, and Infrastructure is mandated to establish a cadastral survey system, to formulate standards for maintaining cadastral records and changes, and maintaining the Official Land registry of Maldives which will identify, locate, and collect information on land parcels, disseminate it to stakeholder authorities and maintain this information in a Land Information System.

The Land Information System (LIS) is based around the National Geographic Information System (NGIS). The NGIS establishes the technologies, policies, standards, and the institutional framework to enable geospatial data sharing across government institutions and to the public. LIS will be established on the framework of the NGIS and its main objective is to build the required mechanisms and applications to establish and manage land records. Further to standardize the land transaction process across the local councils. Using Geospatial technologies LIS will be established on and expanded from the current geospatial infrastructure established in MLSA. The project will utilize software provided by MLSA under “**Esri Land Administration Modernization Program (LAMP)**” with the purpose of establishing a computerized system managing land information and land transactions. It will act as a portal for councils, government agencies and other stakeholders to access land records. The project will streamline the current processes and reduce the time taken to conduct land transactions; thus, benefiting the government, businesses, and the public. The LIS will provide authoritative land information necessary for many public programs like land planning, infrastructure development and maintenance, environmental protection and resource management, emergency services, social service programs and so forth.



Current Context

Land records are maintained by the local councils in cities and on islands, who are responsible for creating, updating, and maintaining land transaction details and issuing title documents (land titles or land agreements). These records include information regarding ownership of land, type of ownership, location, parcel dimensions, associated spatial information and the history of the property. Apart from councils, some government agencies also maintain land records. The title documents are currently issued and maintained in hardcopy format.

Objective

Design and implement a land information management system based on ESRI technology to be provided by MLSA under the “LAMP” program. The system should be capable of creating, updating, and maintaining land parcels, land records and land transactions, and generating and maintaining land title/Registry documents and maps.

Scope of Work and Requirements

The Consultation Team shall:

- Investigate process and mechanisms utilized in managing land transactions within the Maldives for a selected set of councils
- Provide detail technical proposal and advise MLSA on which international standards (ISO-LADM) can be effectively applied to the Maldives context.
- Work closely with MLSA, Ministry of National Planning Housing and Infrastructure, National GIS staff, other relevant stakeholders, and ICT (Information and Communication Technologies) staff to develop, test, upscale, and monitor the application
- Establish multi-user web applications applying MSSQL, geodatabase and Esri’s software
- Develop the application utilizing ESRI parcel fabric for:
 - creating, updating, and managing parcels
 - tracking history
 - generation of required maps and title documents
- Ensure the storing and management of scanned copies of existing title documents
- Create user access management to define protocols and roles to control access to different datasets
- Ensure dissemination of selected base map layers through services to be consumed by other geographic systems solutions via REST APIs
- Ensure the ingestion of necessary base map layers allowing MLSA to create, update, store, view, analyze and publish land information
- Ensure that the application supports future expansion and integration into other applications and business systems
- Deploy a Beta (MVP) version of LIS Implementation, collect and analyze feedback, and provide recommendations as to how to resolve identified issues, make required changes found in the MVP according to feedback received.
- Deployment the final LIS version with final changes according to feedback.
- Provide user manuals along with training materials and conduct ‘train-the-trainers’ training for selected MLSA staff
- Prepare and submit specified project documents and reports.
- Prepare and submit mission report after end of mission



To assess the LIS concept, design, and interoperability of the multipurpose LIS, the consultation team shall engage with MLSA and other key stakeholders to investigate and verify the current situation of the LIS's role, functions, and operating procedures in the Maldives.

The consultation team shall further provide spatial data management systems expertise to develop an efficient methodology for surveying and mapping of a rural cadaster and demonstrate how these surveys can be integrated with surveys of other areas.

Given the diverse cultural settings in the Maldives the consultation team should demonstrate experience and ability to successfully deliver under such circumstances.

Expected activities

This assignment must be completed in 6 months starting from its signature. The main activities are expected to be:

- Propose his work schedule for the term of his consultancy
- Assess the data available from the selected cities and local councils
- Assess and familiarize land administration and management processes and the Authority's need and council works
- Design and build a system for the LIS along with flexibility for future development.
- Propose a work schedule for the development and testing of geo-database in SQL format and web application
- Develop a land information system management database (geodatabase) and long with web application(s)
- Install Esri Lamp software suite in the development and production to set the environment
- Migrate existing data that are in hardcopy and vector data into the geodatabase and parcel fabric
- Create a development and testing environment for LIS application
- Test all aspects and agreed requirements for the LIS web application and database
- Produce training materials (PPT, PDF, etc...) for LIS web application workflows and functions
- Conduct training of:
 - MLSA ICT team in operating, maintaining, and expanding the application environment
 - MLSA trainers for LIS web application workflows and functions
- Provide a developer manual allowing developers to enhance and expand the LIS framework and how to integrate with other applications
- Prepare mission reports summarizing the activities undertaken, describe the achievements and shortcomings and provide recommendations/suggestions for future developments

Deliverables/Outputs

- Provide Technical proposal Report on existing process and mechanisms utilized in managing land transactions within the Maldives and submit finding with recommendation of intentional standards that can be applied in the Maldives
- Propose and design information models, geospatial data standards, cadastral and land registration into integrated web application
- System configuration and implementation guide and train MLSA ICT team to operate, maintain, and expand the application environment
- Deployment of beta version of LIS Implementation
- Deployment of final LIS implementation
- User manual and training materials for train-the-trainers



- Training of selected staff from MLSA (train-the-trainers)
- Prepare, submit required project documents, and progress reports.
- Final mission report not later than 2 weeks after the end of the mission

Pricing Guide

The consultation team is expected to include in his/her proposal a Firm Fixed Price (FFP) in United States Dollars for carrying out this task. The fee must include the following:

- Consultancy fee.
- International Travel (international consultants only)
- Accommodation and other incidental costs.

The consultation team is expected to provide their own laptop computers and other professional support if needed. (MLSA will provide remote access to resources during the project period)

Duty

The consultation team should work on site during initial data collection and research, system testing, deployment, and training. MLSA will facilitate all necessary services required to perform the consultant's task while on-site the consultant is expected to identify in his schedule the plan for onsite presence during the term of his consultancy.

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Expected Completion Date

The duration of the contract is 6 months starting from its signature.

Bidder Qualifications

The bids are open to local or international firms. The participating bidder

1. Shall be a registered firm and should meet the following criteria:

Particulars	Required Qualification
a. Years of Experience in ESRI Software's	Shall have minimum 5 years of experience in the field of development must complete at least 1 project using ESRI software suites.
a. Minimum number of GIS / similar field projects undertaken	Shall have undertaken at least two GIS software developments in land tenure, Cadaster and Registration projects that involves development of a similar spatial data management system during the past 15 years

1. None-compliance of both (1a) and (1b) qualification will result in disqualification of the bidder.

1. The Bidder shall also demonstrate that it has on-going projects whether similar in nature.



Technical Qualification

The team should consist of the following members who can perform the following roles, (Note: **one member can perform two roles if needed**):

Role	Experience Requirements	Education Qualification
Team Leader / GIS specialist	At least 15 years of experience Land administration consultant, have experience with parcel fabric directing development team in the design, development, coding, testing, and debugging of applications using parcel fabric and python,	Master's Degree in Land Management, Land Administration, Geomatics, Geospatial Sciences, Surveying, or a related field Any Professional Certification is an added advantage related field.
Database Engineer / Developer	At least 15 years of experience with ESRI software suits a similar role. familiar with Python, Java framework and JavaScript API integration with ESRI software and Familiar with database relations with ESRI software.	Bachelor's degree in computer programming, computer science, or a related field Any Professional Certification in Back end in API-Development will be an added advantage.

Payment Schedule

Installment of payment /Period	Deliverable or Documents to be Delivered	Approval Should be obtained from	% Of payment
1 st Installment	Upon contact signed		15%
2 nd Installment	Upon Investigation Report		5%
3 rd Installment	Upon System Document for application	Approved By MLSA	10%
4 th Installment	Upon Setting up of Beta Environment for testing		10%
5 th Installment	Upon Finalizing Final product and training materials and Staff Training	Approved By MLSA	40%
6 th Installment	Upon End Mission Report		15%
7 th Installment	After service period minimum 3-month support		5%

