DEVELOPMENT OF SPATIAL DATA INFRASTRUCTURE

Punjab Urban Land System Enhancement Project,

Board of Revenue Punjab

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Contents

1. INTRODUCTION

The Board of Revenue (BoR), Punjab initiated the "Punjab Urban Land Systems Enhancement Project" in 2022 to improve province-wide land[1] administration functions of the Government of Punjab. PULSE will be implemented over a period of five years through a dedicated project management unit led by BoR (PMU-BoR) and a project implementation unit led by the Punjab Land Records Authority (PIU-PLRA).

The development of a provincial spatial data infrastructure (provincial SDI) for Punjab is one of the components of the PULSE project. The vast amount of data collection during project implementation will address the needs of multiple stakeholders and users in the Government of Punjab, aimed at sustainable land administration and management practices. For this purpose, the PIU-PLRA will conduct necessary studies in Phase 1 to establish a provincial SDI.

The PULSE project generally and the SDI component specifically build on the previous efforts of the BoR/PLRA in compiling and managing millions of land records through years of sustained efforts in digitizing historical data as well as creating new land records digitally. Geospatial information will add substantial value to Punjab's economy and society with respect to the planning, implementation, monitoring and evaluation of development projects. However, the full potential of these technologies is unlikely to be realized until the provincial government takes the necessary steps to create viable frameworks to facilitate access to spatial information assets that are held by various public sector organizations to maximize the overall usage.

In recognizing that the establishment of an SDI should be based on an integrated approach to develop policies, institutional and legal arrangements as well as appropriate technologies that facilitate the availability of and access to spatial data, the BoR/PLRA has developed the Terms of Reference for a consulting firm to conduct a feasibility study in the first phase.

[1] Land is "a key economic resource inextricably linked to access to, use of and control over other economic and productive resources" (FAO; World Bank; UN-Habitat 2020). Effective utilization of land-related information is essential for generating economic benefits for the entire society. The United Nations Committee on Global Geospatial Information Management (UN-GGIM) recognizes 14 fundamental themes of geospatial data, including cadastral information, land cover, and land use, all of which are vital components of a broader SDI. The implementation of SDI has the potential to significantly improve the efficiency and effectiveness of geographic information related to land, leading to time and cost savings for economic development. Without the implementation of SDIs, it is impossible to fully realize the socio-economic benefits of geospatial data for national and regional development. That is why the goal of most countries today is to have a multi-purpose land cadastre.

2. SCOPE & OBJECTIVES OF THE STUDY

The main goal of the consultancy is to assess the current status of geospatial data and infrastructure in Punjab province, to identify gaps and challenges and to develop a comprehensive strategy for the establishment of a provincial SDI. The consulting firm(s) will build on the existing reports of strengthening geospatial response in Punjab developed in 2022 and 2023. The reports will be provided by the PIU-PLRA.

The deliverables to be provided by the consulting firm(s) are the following:

2.1 Desk Review

a. To determine the number of established cadastral information system in the region and their contribution/inter-operation to the SDI.
b. To identify the key local policies relevant to SDI and their possible social, economic and societal benefits.
c. To identify possible agencies from various sectors that can benefit from the SDI, and to categorize these agencies based on their potential roles and interests.

2.2 Need Assessment

a. To evaluate existing resources for the implementation of SDI and to determine current and future needs along with identifying gaps.

    i. The province's geospatial data availability and quality (e.g., if available, Cadastral Maps, Addresses, Buildings and settlements, Elevation and depth, Functional areas, Geographical names, Geology and soils, Land cover and land use, Land parcels, Ortho-imagery, Physical infrastructure, Population distribution, Transport networks, Water, and a Geodetic reference Framework.)
    ii. Data Standards and Interoperability (whether geospatial data adheres to established standards and the interoperability of different data sources and systems)
    iii. Data Access and Sharing (whether data is accessible to different stakeholders and the barriers to sharing data across different organizations and sectors)
    iv. Data Management and Governance (policies, practices, and systems in place for managing and governing geospatial data, including data storage, maintenance, and archiving)
    v. Technical Infrastructure (hardware, software, and networking infrastructure required to support geospatial data management and analysis)

vi. Identify and engage key stakeholders, including government agencies, private organizations, and citizens, to gather their inputs, feedback, and requirements for the SDI.

vii. Review the Legal and policy framework. Identifying and addressing legal and policy barriers to the development of the SDI, including data sharing, intellectual property rights, privacy, and security issues.

b. To highlight which provincial and national strategic objectives, disaster management and response, policies and priorities are satisfied by the cadastral information system.

c. To conduct a detailed evaluation of the BoR, PLRA, and PULSE's institutional capacities to provide the services that the SDI will need to offer to its potential users and to propose the optimal arrangement and structure to ensure the seamless provision of such services.

d. Identification of:

I. Significant local and national assets which will be used for the SDI

II. Extent of adequacy/suitability of the existing facilities at PULSE/PLRA/BOR.

III. How SDI will complement other developments taking place in the area.

2.3 Identification of Key SDI Prerequisites

a. Identify essential technological, legal, policy and fiscal framework related to cadastral information system.

b. Ensure that institutional and legal aspects pertaining to the development and implementation of the Cadastral information system are well addressed.

2.4 Identification of Critical Success Factors & Key Performance Indicators of SDI

a. To identify and classify critical success indicators and risk factors related to cadastral information system.

b. To identify key performance indicators of SDI related to cadastral information system.

2.5 SDI Services and Features

a. Propose required SDI key features and services for collecting, managing, analyzing, sharing, and publishing geospatial data.

b. Develop a detailed analysis of proposed SDI features/ services related to PULSE/PLRA/BOR land in the short and medium term (horizon-scanning for new services and features as technology and access improves).

2.6 Management and Governance Structure

a. Based on the information gathered in the needs assessment, design a governance structure for the SDI
b. Prepare a detailed Organizational and Management Structure
c. Based on the identification and engagement with key stakeholders, propose possible future roles
d. To clearly define delineate reporting lines and interrelationships between key stakeholders.

2.7 Human Resource Plan for SDI

a. To review current HR skills and capabilities for the SDI related to PULSE/PLRA/BOR land.
b. To propose capacity building strategies.
c. To define respective roles of the personnel.
d. To determine qualification of required HR include a Training Needs Assessment
e. To suggest salary packages to ensure staff retention.

2.8 Financial Business Model

a. Study the current and future investment options for the Cadastral information system. These options can include, but are not limited to, investment based on grant from World Bank or PPP model.
b. Prepare a detailed financial business model for the SDI.
c. Identify SDI risks in a form of risk register and their possible mitigation

2.9 SDI Data Center

a. Identification of critical ICT infrastructure and equipment for PULSE/PLRA/BOR.
b. Identification of Cyber Security Framework
c. Feasibility of Private Cloud
d. Appropriate Backup and Disaster Recovery Planning
e. Identification of relevant ISO / OGC Standards
f. Precise estimation of volume of spatial and non-spatial data

2.10 SDI Development Plan

a. Based on the information gathered and the institutional, technical and financial analyses and recommendations, prepare a complete and detailed medium term (5

years) SDI Phased related to PULSE/PLRA/BOR Implementation and Execution Plan including:

i- Key work packages, identifying likely costs, activities, resources needed and dependencies.

ii- Identification of stakeholders for inclusion in the various phases of the Implementation and Execution Plan for the SDI.

iii- Assessment of financials

3. ELIGIBILITY CRITERIA

a. Registration with Government entities (Pvt. Ltd. and registration with SECP, FBR, PRA, PASHA);
b. Valid/active NTN and GST Number with Income Tax return from 2020 to 2022;
c. Experience with similar nature of feasibility study or implementation SDI / NSDI projects in Pakistan or other countries *;
d. Proven experience with implementation of GIS / IT / SDI projects at national level.
e. Team may consist of ICT Specialist (ideally with experience in policy interventions), Financial Specialist, GIS Specialist etc.
f. Team lead having PhD degree (with 10 years of experience) in related disciplines (Geoinformatics, GIS, CS, IT) and experience of handling feasibility study or implementation SDI / NSDI projects along with; &
g. Has performed similar services of at least 50 million PKR.

* in case of JV/consortium, local firm should be a leading partner. Documentary proof *must be enclosed with the bid.*

4. DELIVERABLES

a. The firm shall submit an inception report comprising detailed methodology and work plan after the signing of contract.
b. The firm shall submit feasibility reports on:
    i. Desk Review, Need Benefit, Identification of Key SDI Pre-req, Critical Success Factors
    ii. SDI Development Plan, SDI Services and Features, Geodetic Framework
    iii. Management, Governance, HR, Financial Business Model
    iv. SDI Data Center

5. TIMELINES AND PAYMENT SCHEDULE

The Payment will be released against submission and acceptance of reports under Scope of Services as follows:

Activity	Deliverables	Duration (in months)	Requirement	Payment **(% of contract price)**
FEASIBILITY				
Milestone-1	Inception report	1	Approval of the Report	10%
Milestone-2	Desk Review, Need Benefit, Identification of Key SDI Pre-req, Critical Success Factors	2	Approval of the Report	30%
Milestone-3	SDI Services and Features, Management, Governance	1	Approval of the Report	30%
Milestone-4	HR, Financial Business Model, SDI Development Plan, SDI Data Center	2	Approval of the Report	30%
Total		6		100%