Ministry of Forests and Soil Conservation

**REDD Implementation Centre**

Forestry Complex, Babarmahal, Kathmandu

**Terms of Reference for**

**Upgrade database management system of Department of Forest Research and Survey (DFRS) (budget head: 2.12.1.53)**

# Background

Almost 45 percent of Nepal’s land area is covered by forests. Various policy documents, including Nepal's Nationally Determined Contributions (NDC) recognize the need to sustainably manage forest resources since forests are an important part of the national economy and the fight against climate change. Nepal is globally known for its community-based approach to sustainable resource management which has significant potential to be expanded and benefit additional communities and forest-enterprises. Other opportunities for enhancing the role of forests in Nepal include watershed management for securing water quality and quantity in the long-term and nature-based tourism which will contribute to the local and national economy.

The World Bank, through FCPF, has been supporting the Government of Nepal on its efforts to reduce emissions from deforestation and forest degradation, and foster conservation, sustainable management of forests, and enhancement of forest carbon stocks (REDD+). Under the Readiness Fund of FCPF, a grant of $3.6 million was signed with the government in 2011 to help the country get ready for REDD+ through technical studies, consultations and capacity building activities. Since then, the government through the REDD Implementation Center (REDD IC) in the Ministry of Forests and Soil Conservation (MoFSC) has completed preparation of reports on national reference emissions level; national measurement, reporting, and verification (MRV) system; national REDD+ strategy; draft Strategic Environmental and Social Assessment (SESA) and Environmental and Social Management Framework (ESMF); REDD+ implementation framework; feedback and grievance redress mechanism; and so on. The full suite of studies completed to date is publicly available on the Internet (www.mofsc-redd.gov.np).

The REDD+ Readiness Grant ended in August 2015. To continue national REDD+ readiness, the government requested the FCPF for additional US$5 million in November 2015. Based on the self assessment report (i.e. R Package) of the progress achieved under the readiness grant that was approved by the 9th Participant's Assembly and 22nd Participant committee meeting of the FCPF held in Accra Ghana in 2016, the World Bank decided to provide additional grant of US$ 5 million. The Bank entered into the grant agreement with the Government of Nepal in early 2017 for this additional financing.

The success of a national REDD+ program will depend much on a robust yet transparent information system that can link to relevant databases on carbon and other social and environmental aspects. The existence of information and internet technology can be used for rapid and robust data entry, data management and analysis and output generation. Database system developed in the Ministry of Forests and Soil Conservation (MFSC) should serve as the National Forest Database (NFD) incorporating comprehensive data on themes related to forest resources, forest management, carbon stocks, forest users and REDD+ activities. Ideally the database should cover all forest types including community forests, collaborative forests, leasehold forests, national forests, government managed forests, forests under protected areas and buffer zones, private forests and religious forest. Different departments including Department of Forests (DoF), Department of Forests Research and Survey (DFRS), Department of National Park and Wildlife Conservation (DNPWC), Department of Soil and Watershed Conservation (DSWC) and Department of Plant Resources (DPR) maintain database of different types. Therefore, each department should have properly managed and updated database of their own. Further, these databases should also serve as a part of the NFD.

Department of Forest Research and Survey (DFRS) is the central authority for designing and operating National Forest Monitoring System (NFMS) and maintaining a comprehensive and regularly updated database system in it. However, the current database system in the DFRS was not designed considering REDD+ and its MRV requirements. As the central authority for NFM system and REDD+ MRV, the existing database system in the DFRS should be updated, expanded and maintained to comply with national and international requirements for effective REDD+ policy implementation and trading emission reduction. Existing database system of the DFRS needs to be assessed and upgraded to enhance its capacity (scope). DFRS authority has informed that the existing database and its operating system is not functional enough to serve for emerging REDD+ and related reporting requirements like MRV, carbon registry, biannual report etc.

# Objectives

* To update and upgrade database system of DFRS and develop a reporting platform.
* To develop DFRS's capacity to operate upgraded database system.

# Scope of the assignment

The service provider should study the FRA field form and existing system before developing the relevant application architecture. Existing data should be accommodated in the updated system. Focus should be drawn on developing query platforms for displaying various cross cutting tabular, graphical and GIS based reports. Client should also be able to fetch relevant data for statistical analysis. Service Oriented Architecture should be used so that the system can be integrated with both web and android clients.

Service provider should study the existing hardware and network resources and suggest addition of any equipment.

As described earlier, existing database system of the DFRS needs to be upgraded considering additional scope including storing and retrieving of data related to regular forest monitoring, REDD+ MRV and other information related to national forest monitoring system (e.g. sample plot level data). The upgraded database system will have larger scope and mechanism to incorporate and integrate diverse data types for various forestry thematic applications related to forest resources and other requirements sought as important in inception of work. The database should be able to incorporate spatial data like coordinates of each of the sample plots, boundary maps of different forest management units and regimes. The database structure should be sufficiently flexible to incorporate additional thematic data in future.

# Field manual and tally sheet shall be used as input for the system and tables and figures in the FRA reports should be the output of the system. Consulting firms are requested to collect those documents from DFRS.

# Approach and work plan

Agile software development methodology should be followed. The assignment could involve the following approach:

* Requirement Analysis
* Inception Report Preparation, Presentation, feedback collection and Submission
* First Iteration
	1. Primary Architecture Design, feedback resolution and submission
	2. Front end design (web) with static values, presentation and feedback resolution.
	3. Database development / update, Backend Coding, Testing
	4. Level I application presentation, feedback resolution and report submission
* Second Iteration
	1. Edit architecture
	2. Edit Front end design
	3. Database development / update, Backend Coding, Testing
	4. Level II application presentation, feedback resolution and report submission
* Third Iteration
	1. Edit architecture
	2. Edit Front end design
	3. Database development / update, Backend Coding, Testing
	4. Level II application presentation, feedback resolution and report submission
* System Deployment, Report Submission
* Capacity building of staff

# Expected Output

 A fully operational system with defined scope of work and following outputs are required:

* The system should be able to print various summary reports which can be used to measure the reliability of the system.
* Web based GIS mapping system to share data and products
* Operational forest resource assessment data entry, analysis and reporting system (preferably adopting widely used and easily configurable open source systems such as Open Foris)

# Team composition

A consultancy firm/consortium with related national experts is expected to undertake the assignment. The following is the list of required experts for the assignment.

**Key Experts**

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| --- | --- | --- | --- |
| SN | Team member | Qualification | Experience |
| 1 | System Analyst / Project Manager | At least BE in Computer Science or similar, Preferably ME in computer Science | At least 5 years of experience as system analyst |
| 2 | Forest Inventory Specialist | At least MSc in Forestry or similar | At least 3 years experience in Forest Inventory, Preferably experience in data analysis and report writing of national forest resource assessment  |
| 3 | JAVA Developer | At least BE in Computer Science or similar | At least 3 years experience as Application Developer / Programmer / Software developer |
| 4 | Database Developer | At least BE in Computer Science or similar | At least 3 years experience as Database Developer  |
| 5 | Web Developer / Web Designer | At least BE in Computer Science or similar | At least 3 years experience as web developer |
| 6 | System Administrator | At least BE in Computer Science or similar | At least 3 years experience as system administration |
| 7 | GIS Specialist | At least Bachelor degree in computer science or similar | At least 3 years experience as GIS Expert preferably experience on open GIS  |
| 8 | Document Officer / Operators | At least BE in Computer Science or similar | At least 3 years experience in document writing |

# Qualification and competency of consulting firm/consortium

The consulting firm/consortium for this assignment should have a demonstrated ability and relevant experience in successfully completing similar assignments including database development, capacity building in the field of the assigned assessment and operate information system.

Failure to meet the eligibility criteria- minimum five years of experience, intact tax payment status-means automatic disqualification. Other requirements not mentioned here will be based on financial regulations of Government of Nepal.

**Experience Criteria:**

* Development and management of operational web GIS/Mobile apps system. Demonstration of at least one project completed.
* Design and development of national/regional administrative level mapping under themes related to forest/natural resource management/socioeconomics.
* Experience with developing course materials and implementing training course for forest resource inventory/mapping.
* Experience with land use/cover mapping projects.
* Experience in spatial data entry
* Design and development of database for themes related to climate change adaptation and REDD.

# Duration of work

This assignment should be completed 15 days before the end of current fiscal year Nepal.

# Reporting requirement

* The service provider should submit Final completion report including suggestions/recommendations, documentation with Final System Architecture, Database Design, User Manual and other reports as defined in the approach section.
* Both hard copy and soft copies of all reports should be submitted to REDD-Forestry and DFRS.

# Deliverables

The following deliverable must be provided. The proposed deadline for each deliverable should be specified in the full proposal and finalized in the inception report.

**1. An upgraded and comprehensive database system (hardware, software and purchased other accessories) and updated database;**

**2. Capacity building (staff training) on data entry and database management.**

# Selection procedure

A consulting firm will be selected using World Bank's Quality and Cost Based Selection (QCBS) procurement procedures.

# Payment schedule

REDD IC plans to provide lump sum payments in agreed numbers of installment, each linked to a particular deliverable. Three time payments could be made - first installment of 20% of the contract amount against an acceptable inception report, second 40% against a draft final report and third and final 40% against an acceptable final report after the completion of all the activities listed in the ToR. There will be a provision of 10% mobilization advance against the bank guarantee.

# Contact person

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