

بِسْمِ اللّٰهِ الرَّحْمٰنِ الرَّحِیْمِ



Ministry of Climate Change, Environment and Energy
Republic of Maldives

**DIGITAL MALDIVES FOR ADAPTATION, DECENTRALIZATION AND
DIVERSIFICATION (D'MADD) PROJECT
P177040**

TERMS OF REFERENCE

for

**Hiring a Consultant for TA to Conduct a Comprehensive Needs Assessment
and Develop a Technical Requirements Specification for Implementing an SD-
WAN Network for Expanding the Maldives National Computer Network**

Reference No: MV-MOECCT-DMADD-429373-CS-QCBS

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1. INTRODUCTION

The Digital Maldives for Adaptation, Decentralization and Diversification (D'MADD) Project (P177040), aims to support the Maldives in its digital transformation. The D'MADD project is funded by a grant from the World Bank and is implemented by the Ministry of Climate Change, Environment and Energy (MCCEE). The key stakeholders include the National Centre for Information Technology (NCIT), the Communications Authority of Maldives (CAM) and the Department of National Registration (DNR).

The Project aims to enhance the enabling environment for the digital economy in Maldives, to improve identification for in-person and remote service delivery, and to leverage data and analytics for a green, resilient, and inclusive development. It is designed around three components, and the proposed activities are conceived following the country's priorities and funding needs in the medium term. The components are as follows:

Component 1: Enabling environment for improved digital connectivity and competitiveness.

- 1.1. Improving regulatory frameworks, oversight, and enforcement for a competitive broadband market
- 1.2. Empowering public institutions for digital transformation in Government

Component 2: Digital identification for improved online and in-person service delivery.

- 2.1. Legal and institutional enablers and safeguards for secure data and identity management
- 2.2. Modernizing of the foundational ID system and credential
- 2.3. Strengthening the digital authentication ecosystem

Component 3: Digital technologies and data platform for climate resilience

- 3.1. Establishing a climate data platform
- 3.2. Leveraging digital technologies and tools for climate adaptation

2. BACKGROUND

The National Centre for Information Technology (NCIT) plays a critical role in the technological advancement and digital infrastructure of the Maldives. Assigned with the mandate to oversee the development and maintenance of critical government IT systems, NCIT serves as the backbone of the government of Maldives digital ecosystem.

NCIT in partnership with the Local Government Authority (LGA) expands the National Computer Network (NCN) to remote islands. Currently the infrastructure of the local Internet Service Providers (ISP) leased for this expansion. The government allocates massive amounts of funds to internet service providers to maintain a 2 Mbps connection, which unfortunately falls short of meeting modern requirements. Additionally, local councils directly bear the cost of separate internet connections. These requirements obligations create a recurring financial strain on managing the critical communication services within the government, particularly for local councils and other national organizations with remote branches that aim to provide decentralized services.

The NCIT has started to explore the concept of the software defined networking within its infrastructure especially in the wide area networks (WAN) to connect local island institutions to NCN. A SD-WAN (Software Defined Wide Area Network) solution is proposed to address the financial and technical challenges by aggregating connectivity from different service providers, optimizing the network performance and enhancing the security. The solution will address the redundant costs, capacity and support challenges and establish reliable and affordable “Private Government” Connectivity. This document defines the deliverables, expected timelines, and scope of work for a firm (The Consultant).

This Terms of Reference (TOR) will support subcomponent 1.2 of the D’MADD project, “Empowering public institutions for digital transformation in government”, enabling environment for improved Digital Connectivity and Competitiveness, focusing establishing a software defined wide area network that meets the requirements of modern-day workflows while maintaining its reliability, cost effectiveness and security.

3. OBJECTIVE

The objective of this assignment is to engage an experienced and qualified firm (The Consultant) to study and develop a comprehensive needs assessment, design the SD-WAN topology and its infrastructure, finalize the hardware and software requirement to implement a SD-WAN Network across geographically dispersed locations using available internet bandwidths.

The Consultant is expected to identify the government’s requirements to operate the NCN spanning throughout the Country using SD-WAN technology. The consultant is required to gather requirements, conduct studies and formulate a technical requirement TOR along with

a blueprint that would serve as the requirement document for vendors to propose their proposals for implementing a SD-WAN network with a through proof of concept that tests the vendor's proposals against the test cases formulated by the consultant. The POCs will then be evaluated by the consultant along with personnel from NCIT to assure the finalization of a SD-WAN solution that increases the Operational capacity in terms of speed, reliability and security while eliminating the redundant cost that is associated with having a separate leased circuit for the expansion of NCN.

4. SCOPE OF WORK

The following scope of work outlines in general, the activities and responsibilities expected from the Consultant to successfully achieve the stated deliverables in Section 5.

4.1. Assessments:

- 4.1.1. Engage with key stakeholders identified by NCIT.
- 4.1.2. Collaborate with key stakeholders to gather requirements, inputs and ensure alignment with the government's objectives for the SD-WAN network deployment.
- 4.1.3. Analyze bandwidth, speed and reliability across various regions in the Maldives to identify potential target islands for SD-WAN network deployment.
- 4.1.4. Identify potential challenges associated with migrating from the existing WAN network to the proposed SD-WAN network to develop a comprehensive strategy that contains the steps and actions required for the migration.
- 4.1.5. Evaluate existing network components, architectures and services provided.
- 4.1.6. Identify potential redundancy options for areas with access to multiple internet connections and provide recommendations and design options to ensure network availability and redundancy.
- 4.1.7. Based on the outputs from the above sections, provide a final list of recommendations of xx islands for SD-WAN network deployment.

4.2. Technical Requirement Formulation:

- 4.2.1. Draft a detailed Technical Requirement Documentation for the procurement of equipment based on the chosen SD-WAN solution which is compliant to the World bank Standards.

- 4.2.2. The TOR should include specifications, quantities, and estimated costs for all required equipment.

4.3. Proof of Concept (POC):

To ensure a successful SD-WAN implementation that meet's the government's requirements, a thorough proof of concept (POC) process must be conducted. The consultant must conduct the process as follows:

- 4.3.1. Formulate a technical blueprint that consists of the design of the implementation of the SD-WAN solution, ensuring it aligns with all the requirements discovered in 4.2.
- 4.3.2. Develop the test case and scenarios that will be used to benchmark the POC evaluations. These should asses' various functionalities crucial for the project and should completely test to assure that the government's requirements are met.
- 4.3.3. Lead the evaluation team in analyzing the proposals from the potential vendors focusing on how well the vendor's solution meets both the overall project's requirements and evaluate the cost-effectiveness of each solution while assuring technical capabilities of each solution to assure compatibility with existing infrastructure without any compromise in security and reliability.
- 4.3.4. Conduct controlled POCs with the shortlisted vendors to evaluate their solutions in a practical setting for hands-on assessment to determine the best fit candidate.
- 4.3.5. Measure and compare key performance indicators (as indicated by the test case and scenarios) such as speed, reliability, and security during the POCs.
- 4.3.6. Prepare a comprehensive POC report detailing the POC results inclusive of the individual vendor performance data providing a clear understanding of each solution's strengths and weaknesses.
- 4.3.7. Conduct comparative analysis of the evaluated solutions highlighting the key differences and areas of advantages.
- 4.3.8. Formulate a well-supported recommendation and the technical requirement document required to continue the procurement for the most affordable, reliable, and secure solution that best meets the government's needs based on the result of the POC.

4.4. Reporting and Presentation:

4.4.1. Prepare a comprehensive report summarizing all project findings, recommendations and limitations minimally including:

- i. POC results and recommendations.
- ii. Internet penetration study findings and island prioritization.
- iii. Equipment procurement TOR.
- iv. Develop a presentation summarizing the key findings of the project for stakeholders.

5. DELIVERABLES AND TIMELINE

Based on the above-described general scope of work for this assignment, in close coordination with D'MADD project's Project Management Unit (the PMU) and NCIT, Consultant shall be responsible for delivering the below outputs:

Deliverable	Delivery
Item 1: Needs assessment & Internet penetration study report with island identification. Item 2: Collection of requirements & stakeholder goals Item 3: Technical Requirements/ TOR for Procurement of SD-WAN	35 calendar days
Item 4: Blueprint For SD-WAN Deployment & Architectural Diagrams Item 5: Test Cases & Scenarios for SD WAN POC Evaluation	25 calendar days
Item 6: POC Proposal Evaluation Results	20 calendar days
Item 7: POC Test Results	20 calendar days
Item 8: Compiled Consultancy Summary Report Consisting Minimally of: 5.1.1. Internet Penetration Study Results 5.1.2. Island Prioritizations 5.1.3. Key Findings of Consultation, Recommendations & Limitations	20 calendar days
	120 calendar days

6. PAYMENT SCHEDULE

Payment will be made in full to the consultant by the PMU, upon submission of the deliverables, conditional upon the NCIT approval.

Deliverable	%
Upon Signing of contract	10%
Item 1: Needs assessment & Internet penetration study report with island identification. Item 2: Collection Of Requirement & Stakeholder Goals Item 3: Technical Requirements/ TOR for Procurement of SD WAN	30%
Item 4: Blueprint For SD-WAN Deployment & Architectural Diagrams Item 5: Test Cases & Scenarios for SD-WAN POC Evaluation	20%
Item 6: POC Proposal Evaluation Results Item 7: POC Test Results	20%
Item 8: Compiled Consultancy Summary Report Consisting minimally of: <ul style="list-style-type: none">• Internet Penetration Study Results• Island Prioritizations• Key Findings of consultation, recommendations & limitations	20%

7. INTELLECTUAL PROPERTY

All information pertaining to this project (documentary, audio, digital, cyber, project documents, etc.) belonging to the client, which the consultant may come into contact within the performance of his/her, duties under this consultancy shall remain the property of the client who shall have exclusive rights over their use. Except for purposes of this assignment, the information shall not be disclosed to the public nor used in whatever manner without written permission of the Client in line with the national and International Copyright Laws applicable. All the material used in the project should be provided to the client with copyrights cleared.

8. INSTITUTIONAL ARRANGEMENTS, REPORTING AND SUPERVISION

- 8.1. The consultant will work under the guidance and direction of the NCIT, and the D'MADD PMU will be coordinating the assignment.
- 8.2. The Consultant must be able to travel to the Maldives where physical presence is needed and will be agreed upon with adequate time (Minimum Twice).

- 8.3. Unless approved and agreed by the D'MADD PMU, the consultant shall not directly communicate, obtain, or share any documentation with any other party except NCIT.
- 8.4. The consultant shall report to the Project Manager of the D'MADD Project PMU and NCIT, on the status of the assignment on a regular basis. The consultant will work in a place agreed with the PMU and will be required to take part in all the relevant meetings.
- 8.5. All reports shall be submitted as stipulated in the deliverables and all reports will be submitted as drafts and upon review by the NCIT, the Consultant shall revise the draft reports. Once the revised reports are accepted by the NCIT they will be termed as final reports by the NCIT to process the payments.
- 8.6. All draft documents should be in Microsoft Word and all final documents in Adobe Acrobat format with relevant signatures where needed.
- 8.7. All materials developed under this TOR shall be approved by the NCIT and PMU.
- 8.8. The Consultant shall ensure that all outputs are delivered on time, and in accordance with quantity, quality and timeframe in the proposal submitted by the consultant based on the TOR.

9. QUALIFICATIONS AND EXPERIENCE

9.1. Requirement of the Firm

- Minimum three (3) years of proven experience in information and communication technology infrastructure development projects or consultancy services related to similar assignments.
- Minimum of one (1) successfully completed project related to networking/ Internet services/ telecommunications.
- Feasibility/ need assessment study evidence on IT/ network infrastructure projects.

9.2. Requirement expertise of the team

The firm is expected to propose a team of three (3) members. All the requirements given below should be met by the team collectively (i.e. at least one team member should meet any of the requirements). The firm should assign a team leader who will oversee the project, coordinate team efforts, and ensure timely delivery of project milestones. To ensure that a

portfolio of previous projects and work done by all team members should be submitted.

Team Leader

- Bachelor's degree or professional certification in information technology/ networking/computer science/ telecommunication.
- Expert in network infrastructure/ internet services or in a related field with a minimum of four (4) years of experience.
- Experience working in similar business requirements for remote locations is preferred.

Network Specialist

- Bachelor's degree in IT/ computer science /computer networks or a professional certification in a related field, with a minimum of three (3) years of experience in computer networks / network security or in a related field.
- Proven experience in designing and implementing SD-WAN solutions across low-bandwidth environments.
- Ability in conducting POCs and evaluating SD-WAN vendor solutions.
- Strong understanding of internet penetration analysis methodologies.

Finance/ Management Specialist

- Bachelor's degree in business/ finance/ management/ accounting or a professional certification in a related field, with a minimum of 3 years of experience in conducting feasibility studies/ need assessment/ cost benefit analysis and documentation.

10. REQUIRED DOCUMENTS

- 10.1. Reference letters and certifications as proof of the qualifications and experience in Section 10. The reference letters may include project experience letters as well as contract services successfully provided as a firm.

11. SUBMISSION

- 11.1. The deadline for submission of the Expression of Interest is before 10:00am on June 13th, 2024.
- 11.2. You may submit your Expression of Interest through postal mail or by hand-delivering them in sealed envelopes addressed to the Project office.

Project Manager

Digital Maldives for Adaptation, Decentralization and Diversification Project
(D'MADD)

Ministry of Climate Change, Environment and Energy

NCIT Building

No 64, Kalaafaanu Hingun, Male' 20064, Republic of Maldives

Tel: +(960)330-2253

Email: procurement.dmadd@environment.gov.mv