

بِسْمِ اللّٰهِ الرَّحْمٰنِ الرَّحِیْمِ

Ministry of Agriculture and Animal Welfare

Male', Republic of Maldives



Ministry of Agriculture and Animal Welfare

Terms of Reference for Consultancy Service

for

Undertaking Water and Land Use Plan

Ref No: MAP/CS/2023/002

Submission date: 14th December 2023

Foreword

These terms of reference have been prepared by Project Implementation Unit of Ministry of Agriculture and Animal Welfare and are based on the 1st edition of the IFAD-issued standard procurement documents template for terms of reference available at www.ifad.org/project-procurement This document is to be used for the procurement of services in projects financed by IFAD.

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Terms of Reference (TOR)

Consultancy Service for Undertaking Water and Land Use Plan

1. Client

The client for this assignment is the Project Implementation Unit (PIU) of the Maldives Agribusiness Programme (MAP) under Ministry of Agriculture and Animal Welfare (MoAAW).

2. Country background

In the Maldives, basic agricultural information concerning land utilization, area planted, crop production and yield statistics, market information and livestock numbers, production, etc. is lacking. This lack of reliable agricultural statistics has made planning, policy analysis, and formulation of development projects very difficult for the Ministry, NGOs, and donor agencies.

Agriculture makes a considerable contribution to the rural economies and sustainability of rural livelihood. Although Agriculture only contributes to 1.2 % of the GDP and the contribution to the rural community is immense with the provision of food security. It has created a good market chain from the households to the island, atolls, and to the capital.

By 2021 there were 7,100 farmers registered with MoAAW. Most commonly local produce traded in Male' market includes coconut, banana, papaya and cucumber (SYB, 2020). However, farmers and the agriculture sector as a whole face many challenges in carrying out farming across the country.

Farmers lack the necessary technical skills to carry out sustainable agriculture and progress to value added-production. There is lack of appropriate infrastructure for agricultural value chains (such as appropriate irrigation, storage, transportation, market, etc.), and lack of farmers' organizations and opportunities for women to lead agricultural productivity. The government's Strategic Action Plan (SAP 2019-2023) addresses these challenges and aims to achieve the targets set out in the SAP through several policy interventions.

Land and water used plans for islands mentioned are participating in MAP field activities and lacking detailed information on water availability and water extractions use policy/rules. This is particularly critical for HOUSEHOLD use, agriculture, fisheries, natural vegetation protecting the shore and biodiversity of islands. It is therefore necessary to undertake island study to examine the capacity of the water lens, safe level of water extraction related to the level of recharge, vertical upheaval of saltwater and horizontal intrusion for project island not having such information

3. Background on project

The Government of Maldives (GoM) through MoAAW is implementing the Maldives Agribusiness Programme (MAP) with financing from the International Fund for Agriculture Development (IFAD). The PIU set-up within the MoAAW Implements MAP in accordance with the guidelines provided by the project design report, project implementation manual of MAP, and with the guidance of the project steering committee and IFAD supervision missions.

The main aim of MAP is to enable small farmers in the Program area to sustainably enhance their production levels, increase income, secure food and nutrition for their household demands and deliver produce to connected markets.

MAP will be implemented nationwide, covering all regional and sub-regional hubs, clusters and islands, where agriculture is undertaken by small farmers. The main hubs for Programme activities are in region 1-3 including Haa Alif Hoarafushi for region 1. Haa Dhaalu Vaikaradhoo for region 2, and Shaviyani Milandhoo for region 3. Each of these hubs will serve eight (8), nine (9) and nine (9) inhabited agriculture islands respectively.

4. Background of the assignment

- 4.1. One of the outputs of the project focuses on capacity building of the project partners, island farmers in effectively improving land use practices and rangeland conditions at task-specific and more strategic, long-term levels. It is envisaged that through the development of a Water lens plan will benefit from enhanced capacity to sustainably use their natural resources to secure their livelihoods while promoting biodiversity conservation.

5. Overall objectives

- 5.1. Land use plans for islands participating in MAP field activities are lacking detailed information on water availability and water extractions use policy/rules. This is particularly critical for household use, agriculture, fisheries, natural vegetation protecting the shore and biodiversity of islands. It is therefore necessary to undertake a study to examine the capacity of the water lens, safe level of water extraction related to the level of recharge, vertical upheaval of saltwater and horizontal intrusion for project island not having such information.

6. Objectives of the assignment

- 6.1. The MAP Project Implementation Unit wishes to hire a consultant/firm who will provide leadership and documentation in the process of developing a Water and Land Use Plan for 3 islands in the Northern Atolls (HA, HDh, and Sh). The consultant will work closely with MOAAW, the Project Implementation Unit (PIU), local island leaders, and interested stakeholders
- 6.2. A comprehensive Water and Land Use plan for 3 islands should be developed in close coordination and collaboration with technical team of MOAAW.

- 6.3. Consultant/Consultancy need to make sure that land resources are efficiently utilized for any kind of land use activity and develop a recommendation on improving the current situation in the islands
- 6.4. The consultant should also identify monthly safe levels of water extraction across the year, extrapolation of data for use on similar islands, map showing areas where water can and cannot be extracted and the need for infiltration galleries.
- 6.5. The basis for such a study is suitable collection, harmonization and evaluation of the relevant water and land use related information, as well as generally comprehensible presentation and visualization of the planning issues, to support decision making. The assignment will ensure the scientific soundness and application of advanced technologies, to forecast feasible and effective use of land and water resources.
- 6.6. Contribute to identification of potential risks (including potential reluctance and resistance among beneficiaries) and formulate mitigation measures.

7. Approach

- 7.1. Water and Land use must be planned for 3 islands with the focus on conservation of soil, water, and other land resources and new technology of land use.
- 7.2. The consultant / consultancy service should include:
 - 7.2.1. Assess and document current water and land use practices within the island and their relative significance:
 - This will be done in a process involving meetings with island council members, with Agriculture Division members meetings, field visits etc.;
 - Assess the current land use plan of the islands.
 - 7.2.2. Identify and document sustainable water and land use practices that promote:
 - Achieve effective operational efficiencies and cost effectiveness
 - Create a suitable environment that supports range of agricultural research, demonstration and extension methodologies
 - Anticipate the trend of local demand, emerging technologies and evolving agriculture practices and research methodologies
 - Island livelihoods and cultural heritage;
 - Biodiversity conservation;
 - Reduced land use conflicts;
 - Climate change adaptation strategies;
 - Sustainable agriculture;

8. Scope of work

- 8.1. Review previous studies on water lens in Maldivian islands.
- 8.2. Site visits to 03 island for proper understanding of the site, its boundary, and other features that would have planning implications. The service provider shall carry out thorough data collection and do their own analysis of the area.
- 8.3. Water from both HOUSEHOLD wells (15) and agricultural wells (15) should be sampled and tested for Water Quality testing parameters; Turbidity, electrical conductivity, PH, dissolved oxygen, Water Temperature, Color, Odor, Conductivity, pH, Acidity, Alkalinity, Total Dissolved Solids (TDS), Dissolved, Oxygen (DO), Biological Oxygen Demands (BOD), Chemical Oxygen Demand (COD), Total Phosphorous, Total Nitrogen, Chloride, Nitrate, Nitrite, Sulphate, Sodium, Magnesium, Calcium, Iron, Potassium, Ammonium, Total Fecal Coliform. A good sample should be taken and records shared with the reports.
- 8.4. Undertake groundwater survey using restrictive electrical resistivity instrument and ground conductivity.
- 8.5. Undertake UAV mapping of islands using real-time kinematic accuracy with ground points. Supplement the UAV with topographic map and geographical parameters.
- 8.6. Sufficient samples to establish soil permeability.
- 8.7. Conduct well yield test at strategic locations at the islands.
- 8.8. Under social survey if not available to quantify water use for HOUSEHOLD, agriculture, fisheries, tourism and other economic activities existing on the islands. Also establish if the island expires flooding, if flooding how deep, how often and cause to the flooding. Establish potential flood zones of the island.
- 8.9. Estimate rate of lens water discharge and recharge on a monthly basis across the year.

Estimate lens water yield and maximum water extraction monthly across the year.

- 8.10. Using GIS and CAD delineate areas where water cannot be extracted
- 8.11. Provide recommendation if infiltration galleries are need on island both for better infiltration and minimizing flood water.
- 8.12. With use of appropriated statistical analysis extrapolation of finding between islands with similar configuration will be determined

9. Expected Deliverables

9.1. The deliverables will include;

- 9.1.1. Prepare a work plan, meeting schedule, field visits plan, Land Use plan structure and agreed with the Project team;
- 9.1.2. Inception report detailing methodologies and detailed work plan
- 9.1.3. Conduct meetings with island council and relevant stakeholders and undertake field visits to relevant project areas.
- 9.1.4. Analyze all collected data and present the first findings to the PIU team for discussion and identification of gaps. If needed collect additional data for finalization of the analysis
- 9.1.5. The findings will be presented in a price and concise report including tables with key test results and other numerical dates and annexes with detailed test results and other numerical dates.
- 9.1.6. The report will contain clear recommendations on monthly safe levels of water extraction across the year, extrapolation of data for use in similar islands, map showing areas where water can and cannot be extracted and the need for infiltration galleries.

9.2. Prepare all necessary drawing, scheme and map for the islands which will designate land areas for distinct uses based on the analysis so as to sustainably use the natural resources to secure their livelihoods while promoting biodiversity conservation.

10. Reports and schedule of deliverables

- 10.1. Inception report with process guide (detailed Methodology) and plan template and clear timelines.
- 10.2. Finalization and agreeing list of stakeholders and primary research tools.
- 10.3. Questionnaire for need assessment and FGDs
- 10.4. Community and stakeholder engagement report
- 10.5. Draft water lens and land use plan and incorporating all comments and recommendations from PIU, and MoAAW. The report should include:
 - 10.5.1 Groundwater survey using restrictive electrical resistivity instrument and ground conductivity.
 - 10.5.2 UAV mapping of islands using real-time kinematic accuracy with ground points. Supplement the UAV with topographic map and geographical parameters.
 - 10.5.3 Sufficient samples to establish soil permeability and generate reports

10.5.4 Conduct well yield test at strategic locations at the islands.

10.5.5 Under social survey if not available to quantify water use for HOUSEHOLD, agriculture, fisheries, tourism and other economic activities existing on the islands. Also establish if the island experiences flooding, if flooding how deep, how often and cause to the flooding. Establish potential flood zones of the island

10.5.6 Estimate rate of lens water discharge and recharge on a monthly basis across the year.

10.5.7 GIS and CAD delineate areas where water cannot be extracted

10.5.8 Provide recommendation if infiltration galleries are needed on island both for better infiltration and minimizing flood water.

10.5.9 statistical analysis extrapolation of findings between islands with similar configuration will be determined

10.6. Final water lens and land use plan including all drawings, recommendations, and maps

11. Consultant's qualifications and experience

Key expert 1: Team leader

Qualifications, skills and Experience

- Master's Degree in the field of Regional Planning, Environmental Planning, Agriculture Extension/ Agronomy, water and land-use Planning/ land use management or similar field.
- At least 10 years of relevant professional work experience in Land use plan and Environment;
- Evidence of the ability to develop GIS based Land Use Plans

Specific professional experience

- Demonstrated ability to work in partnerships with state agencies, manage and coordinate the work process
- The consultant shall have excellent planning, analytical, report writing and communication skills, and excellent knowledge of English and Divehi
- Familiar with island -based natural resource management and social land management
- Ability to take initiative and to work independently – as well as – part of a team;
- Excellent communication skills

- Excellent report writing, computer, and analytical skills
- Capacity to organize and facilitate senior-level consultative meetings
- Good understanding of international policies and agreements related to sustainable land management

Key expert 2: One engineer/ water hydrologist who double up as team leader

Qualifications, skills and Experience

- Postgraduate degree in engineer/water hydrologist or similar field
- Professional experience of at least 10 years

Specific professional experience

- Experience in undertaking water lens and Land Use Planning studies/work including sound knowledge of planning system including methods, tools, case examples
- Experience in conducting training and organizing workshops, stakeholder dialogue
- Good understanding of international policies and agreements related to sustainable land management
- Experience on Agriculture Extension
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Key expert 3: One assistant engineer/hydrologist

Qualifications, skills and Experience

- Postgraduate degree in engineer/water hydrologist or similar field
- Professional experience of at least 3-5 years

Specific professional experience

- Preferable experience in undertaking water lens and Land Use Planning studies/work including sound knowledge of planning system including methods, tools, case examples
- Experience in conducting training and organizing workshops, stakeholder dialogue
- Good understanding of international policies and agreements related to sustainable land management
- Experience on Agriculture Extension

Key expert 4: Socio-economist

Qualifications, skills and Experience

- Postgraduate degree in economics, finance, statistic or similar field
- Professional experience of at least 5 years

Specific professional experience

- Preferable experience in financial and economic analyses, data analyses and experience on data collection
- Experience in conducting training and organizing workshops, stakeholder dialogue
- Good understanding of international policies and agreements related to sustainable land management
- Experience on Agriculture Extension

Key expert 5: Two land surveyor

Qualifications, skills and Experience

- Postgraduate degree in engineering, geodesist and surveyor
- Professional experience of at least 5 years

Specific professional experience

- Preferable experience in conducting land surveyor
- Experience in conducting training and organizing workshops, stakeholder dialogue
- Good understanding of international policies and agreements related to sustainable land management
- Experience on Agriculture Extension

12. Location and period of execution

12.1. Study will be conducted for the HAC of MoAAW

12.2. Expected duration of this assignment is up to 30 working days after signing the contract and conducting an inspection workshop

13. Project coordination

13.1. Consultant shall operate under the overall guidance and supervision of the Project Director, with technical guidance and support from the Chief Technical Advisor of the project, operational support and direct supervision from the PIU, technical guidance from IFAD, in close collaboration with MoAAW and in consultation with the relevant national stakeholders.

14. Services and facilities to be provided by client

14.1. Full cooperation in facilitating the Services

14.2. Assistance in provision of any letters or other documents required for obtaining Visa and/or Work Permits necessary for expatriate members of the Consultancy Team.

14.3. Available relevant data and information requested by the Consultant regarding existing infrastructure at the Works site deemed to be useful for planning and carrying out the Services.