بسم الله الرحمن الرحيم

Ministry of Fisheries, Agriculture and Ocean Resources

Malé, Republic of Maldives

Transforming Fisheries Sector Management in South-West Indian Ocean Region and Maldives Project (Transform, Swiofish5) - P179242

TERMS OF REFERENCE (TOR)

Consultancy for Biological Studies of Important Reef Fish Species
(Procurement Ref : MV-MOFMRA-502294-CS-CQS-2)

1. BACKGROUND

The Government of the Republic of Maldives through the Ministry of Fisheries, Agriculture and Ocean Resources is implementing–Transforming Fisheries Sector Management in South-West Indian Ocean Region and Maldives Project financed by the World Bank. The project is managed by the Corporate Department / Project Management Unit (PMU) set up within the Ministry of Fisheries, Agriculture and Ocean Resources. The project is implemented in accordance with the Project Implementation Plan (PIP), Project's Procurement Manual, and the Project's Financial Management Manual all of which are aligned with the World Bank's guidelines and procedures on procurement and financial management.

A key activity under the project is the biological study of commercially important reef-associated fish species, aimed at generating robust biological parameters such as age and growth rates, and reproductive characteristics. These parameters will serve as critical inputs for stock assessments and the design of sustainable fisheries management interventions. The study will also support capacity development of national fisheries institution(s) by providing hands-on technical guidance, training, and standardized methodologies for sample collection, processing and data analysis.

2. OBJECTIVE

The primary objective of this consultancy is to support a biological study on key species of reef-associated fish to improve understanding of their biological parameters for stock assessment and management interventions.

TARGET SPECIES

The consultancy covers the following species, that are of importance in the Maldivian reef-associated fisheries:

1. Brown marbled grouper *(Epinephelus fuscoguttatus)*

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2.	Blacksaddled coral grouper *(Plectropomus laevis)*
3.	Yellow-edged lyretail (*Variola louti*)
4.	Red snapper *(Lutjanus bohar)*
5.	Humpback red snapper (*Lutjanus gibbus*)
6.	Bigeye scad (*Selar crumenophthalmus*)
7.	Dark-banded fusilier (*Pterocaesio tile*)

3. KEY STUDIES

The consultancy will focus on the following studies, essential for understanding the species life history and informing resource management decisions:

1. **Age and growth analysis using otoliths** to determine the age structure of the population, estimate growth rates, and assess species longevity

2. **Size and age at maturity, fecundity estimates and classify maturity stages using gonad histology** to determine the reproductive potential of the population.

4. SCOPE OF THE ASSIGNMENT

The Consulting laboratory shall provide the services described in this Terms of Reference (ToR) in close collaboration with the PMU, the Maldives Marine Research Institute (MMRI) and other designated personnel with the aim of strengthening the scientific foundation for stock assessment and management of the selected fish species.

Specifically, the Consulting Laboratory will provide expert guidance to technical staff of the MMRI, the TransFORM Project PMU, and the Ministry of Fisheries, Agriculture and Ocean Resources (MoFOR) on the design, sampling, processing, data analysis, and reporting of fish biological studies focused on growth, ageing, and spawning (using gonad histology).

The Consultant is expected to provide hands-on technical support and mentorship throughout all stages of the study, including:

1. Reviewing and refining study design and sampling plans and developing sampling protocols.

2. Determining, for each species, the types of biological samples required, appropriate sampling locations and timeframes, sample sizes, and suitable preservation methods.

3. Recommending the necessary equipment, materials, and reagents for tissue extraction, preservation, and storage.

4. Assisting with sample preservation and shipment, ensuring adherence to biosecurity, ethical, and logistical requirements for international laboratory processing where applicable.

5. Processing biological samples and delivering structured raw datasets, including high-quality photographs of processed otoliths and histological slides.

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6. Providing guidance to MMRI, PMU, and MoFOR technical staff on data analysis, interpretation, and scientific reporting, including contributions to peer-reviewed publications.

7. Delivering capacity-building support through remote or in-person training (as requested) on sample extraction, handling, fixation, and preservation techniques.

8. Submitting interim and final reports summarizing all activities, methodologies, findings, and recommendations for future studies.

5. DELIVERABLES AND TIMELINE

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Deliverable	Timeline
1. **Methodology Document** - A detailed methodology outlining the biological parameters to be assessed for each species. This document shall include information on sample sizes, locations, sampling periods, number of samples, timelines of activities, sample acquisition methods, fixation and processing techniques, and/or relevant Standard Operating Procedures (SOPs) or review of existing SOPs and protocols. Additionally, the document shall; • identify potential environmental and ecological information, whether measured in situ or available from existing datasets, that may complement the interpretation of biological results • identify potential technical and logistical risks related to sample processing and analysis, and propose practical mitigation measures • list potential peer-reviewed and grey literature relevant to the study • include a comprehensive list of equipment, materials and consumable required for sample acquisition, fixation, preservation and shipping, including chemicals and personal protective equipment (PPE)	Within **45** calendar days from the date of the contract.
2. Training and reference materials - Preparation and delivery of online training, presentations and other reference materials on sampling, sample handling, fixating, and preservation techniques to support capacity development of MMRI, PMU, and MoFOR technical staff.	Within **15** days from acceptance of the Methodology Document.
3. **Structured raw datasets** - Well-organized datasets, including high-quality photographs of processed otoliths and histological samples and histological slides. All datasets should include appropriate metadata describing sampling information, laboratory processing methods, and analytical procedures. All raw and processed data shall be submitted in editable formats and become the property of the Ministry.	Within 30 days from receipt of each batch of tissue samples. Batch number will be known once the methodology has been agreed (deliverable 1).
4. **Technical guidance for data analysis and reporting** - Ongoing technical support provided through remote meetings or working sessions, including contributions to scientific reporting and co-authorship or lead authorship of publications where appropriate.	As requested, upon **25** days of the request
5. **Final consultancy report** - A comprehensive final report summarizing all activities, results, analyses, and recommendations to inform future studies and strengthen fisheries management. It should also include a list of potential recommendations based on the results of the studies,	Within **20** days from acceptance of the last batch of processed datasets

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Deliverable	Timeline
that could be incorporated in future development or revision of Fisheries Management Plans (FMPs).	

6. PAYMENT SCHEDULE

Deliverable	Payment
1. Methodology document	15% of the Contract price upon submission and acceptance of the Methodology document
2. Training and reference materials	15% of the Contract price upon submission and acceptance of the training and reference materials and delivery of training session(s)
3. Structured raw datasets	30% of the Contract price upon submission of the processed datasets
4. Technical guidance for data analysis and reporting	20% of the Contract upon confirmation of the technical support
5. Final consultancy report	20% of the Contract upon confirmation of the final report, provided all other deliverables have been met

7. QUALIFICATION AND EXPERIENCE

7.1. Requirement of the Consultancy Laboratory/Firm

The Consulting Laboratory or Firm shall possess the institutional capacity and laboratory infrastructure necessary to conduct biological analysis of reef-associated fish species, including aging from otolith and gonad histology. The Laboratory shall be capable of providing comprehensive scientific support – from study design and sampling guidance to laboratory processing, data analysis and interpretation, in line with recognized standards for fish biology for stock assessment and research.

7.2. Qualification and Experience Requirement of Key Personnel

Lead Fisheries Biologist / Principal Investigator	- Minimum of Master's Degree in Fisheries Biology, Marine Science or a related field. - Minimum of 5 years of experience in fish biology with demonstrated expertise in age and growth studies using otoliths and gonad histology

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	- Proven record of scientific publications or technical reports related to tropical or reef-associated fish species. - Experience in designing and guiding field sampling programs and mentoring technical staff
Fish Biologist / Otolith and Ageing Specialist	- Master's degree or equivalent in Fisheries Biology. Marine Science or Zoology. - At least 3 years of practical experience in fish age and growth studies, including otolith extraction, preparation, reading and interpretation - Demonstrated experience in ageing and growth studies of tropical or reef-associated fish species.
Reproductive Biologist / Histology Specialist	- Master's degree in marine biology, Fish Physiology or related discipline. - Minimum of 3 years of experience conducting gonad histology and reproductive biology studies in marine tropical fish species. - Expertise in identifying maturity stages, fecundity estimation and spawning patterns of reef-associated species. - Proven ability to develop and apply histological protocols or tropical marine species.
Data Analyst / Biostatistician	- Bachelor's or Master's degree in Statistics, Fisheries Science or a related quantitative field. - At least 2 years of experience in analyzing biological and fisheries data using R, Python or similar statistical software - Experience in applying models for growth, maturing, and spawning patterns.

8. EVALUATION CRITERIA

Procurement process will be conducted through Consultant's qualification-based selection (CQS) procurement method using a Request for proposals (RFP) as specified in the World Bank's "Procurement Regulations for IPF Borrowers" *Procurement Regulations for IPF Borrowers.*

EOI Evaluation Criteria

The consultants' EOI will be evaluated based on the following criteria. However, Firm's Proposals Strengths and Weaknesses Shall be analyzed for the purpose of comparison in order to identify the ***Best Qualifying firm.***

Details	**Weightage**
A) Company Profile and General Experience	**30 Points**

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Company profile demonstrating organizational structure, areas of expertise, and years of operation. (**20 points)**	
Overall experience in of the firm (**10 points)**	
B) Specific Experience in Similar Assignments	**40 Points**
Detailed list of relevant/Similar assignments/Studies conducted by the firm. (10 Points)	
Relevance of assignments / Studies. (20 Points)	
Complexity, scale, and technical nature of assignment completed (10 Points)	
C) List of Key Staff proposed for the positions indicated in the terms of reference	**10 Points**
D) Laboratory Profile – As per requirements defined in 7.1	**20 Points**

Evaluation Notes:

- **Required Documents for EOI:**
- *Letter of Expression of interest*
- *Company registration certificate*
- *Company profile*
- *Laboratory Profile.*
- *Evidence of similar assignments*
- *Reference letters/work completion certificates.*
- *List of Key Staff proposed for the positions indicated in the terms of reference*

- Greater weight will be given to assignments closely matching the scope defined in Section 7.1.
- Experience demonstrating relevance to the assignment; technical depth and multi-disciplinary coordination will be rated higher.
- Projects completed within the last 1-5 years will be given priority consideration

Technical evaluation Criteria:

Experience of the firm (Minimum 5 years); **Specific experience of the Consultant (as a firm) relevant to the assignment/ Past experience in similar assignments;**	(20 Points)

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- Firm shall possess the institutional capacity and laboratory infrastructure necessary to conduct biological analysis of reef-associated fish species, including aging from otolith and gonad histology.	
Qualification and Experience Requirement of Key Personnel: **1. Lead Fisheries Biologist / Principal Investigator (15 points):** - Minimum of master's degree in Fisheries Biology, Marine Science or a related field. (7.5 points) - Minimum of 5 years of experience in fish biology with demonstrated expertise in age and growth studies using otoliths and gonad histology. (7.5 points) **2. Fish Biologist / Otolith and Ageing Specialist- (15 Points)** - Master's degree or equivalent in Fisheries Biology. Marine Science or Zoology. (7.5 points) - At least 3 years of practical experience in fish age and growth studies, including otolith extraction, preparation, reading and interpretation. (7.5 points) **3. Reproductive Biologist / Histology Specialist- (15 Points)** - Master's degree in Marine Biology, Fish Physiology or related discipline. (7.5 points) - Minimum of 3 years of experience conducting gonad histology and reproductive biology studies in marine tropical fish species. (7.5 points) 4. **Data Analyst / Biostatistician (15 Points)** - Bachelor's or Master's degree in Statistics, Fisheries Science or a related quantitative field. (5 points) - At least 2 years of experience in analyzing biological and fisheries data using R, Python or similar statistical software. (5 Points) - Experience in applying models for growth, maturing and spawning patterns (5points)	(60 Points)
Brief document describing relevant elements such as sample processing methodology, ring frequency for otoliths, data structure and format.	(10 Points)
Laboratory Profile	(10 Points)

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9. REQUIRED DOCUMENTS

- Letter of expression of interest
- Company registration certificate
- Company profile
- Proposal briefly describing relevant elements such as sample processing methodology, ring frequency for otoliths, data structure and format
- Laboratory profile
- CVs of the proposed team members (along with educational certificates and individual reference letters for each proposed team member).
- Evidence of capacity to meet the requirements stipulated in section 7.1 including:
    - A detailed list of similar assignments conducted
    - Peer reviewed and grey literature, reference letters, documents etc. on fish biology

10. SUBMISSION

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