



SIOFA | APSOI

Southern Indian Ocean Fisheries Agreement
Accord relatif aux Pêches dans le Sud de l'Océan Indien

Project title: Determination of Biological Reference Points (BRPs) for key SIOFA fish stocks

Project Code: PAM-2024-02

Terms of Reference

1. Introduction

The SIOFA Precautionary Approach and Management (SIOFA-PAM) programme will further enhance the scientific advice of the SIOFA Scientific Committee (SC) for the SIOFA Meeting of the Parties (MoP), in particular towards ensuring the sustainable management of fish stocks and the environmental impacts associated with fishing.

The SIOFA-PAM programme has three main projects that focus on development of a framework to ensure the sustainable management of fish stocks and managing the environmental impacts associated with fishing activities within the SIOFA Area. These aim to guide, inform, and enhance resource protection and to improve sustainable resource management measures, especially in the context of the information-limited fisheries. A fourth project provides for expert review and advice across the three main projects.

The specific projects of SIOFA-PAM will be to:

PAM-2024-01: Develop the SIOFA Precautionary Approach Framework. This project involves establishing a framework for high, medium, and lower information stocks to apply the precautionary approach within the SIOFA Area. This framework will provide guidelines and principles to help ensure that fisheries management decisions are made in a precautionary manner using the best scientific evidence available, consistent with the Objectives (Article 2) and General Principles (Article 4) of the SIOFA Agreement (SIOFA, 2006).

PAM-2024-02: Determine Biological Reference Points (BRPs) for key SIOFA fish stocks. This project focuses on developing and scientifically evaluating BRPs for the key fish stocks within the SIOFA Area, based on the best available scientific data and methods.

PAM-2024-03: Develop harvest strategies for key SIOFA fish stocks. Building upon previous workshops and ongoing efforts by the SC and MoP, this project aims to develop formal harvest strategies for key fish stocks.

PAM-2024-04: Expert Review Panel for the Development of the SIOFA Precautionary Approach and Management. Provide external expert review and advice to the project teams and SIOFA for the work and outcomes of the three main projects.

2. Methods

The determination of Biological Reference Points (BRPs) is a critical component of fisheries stock assessment/evaluations, the Precautionary Approach Framework (PAF) and development of Harvest Control Rules (HCRs). They will be developed so that they can be used to inform fisheries managers about stock's status relative to the BRPs and hence the overall management objectives.

The need for simultaneous consideration of biological reference points and actions to be taken if they are exceeded is made in both the FAO Code of Conduct for Responsible Fisheries (SIOFA Agreement Article 1d) and Article 6 of the United Nations agreement relating to the conservation and management of straddling fish stocks and highly migratory fish stocks (SIOFA Agreement Article 1b).

The current interim BRPs (MoP10 Report, paragraphs 77 and 78) will be reviewed, including the strengths and weaknesses of each BRP. Further, the project will propose interim default BRPs for low, medium, and higher information stocks to enable evaluation of the status of stocks against these reference points. And specifically with guidance for the primary and secondary species identified by SC in 2023 (see Appendix A of the SIOFA Fisheries Overview 2024). The conclusions and outcomes from this objective will be consistent with the PAM-2024-01 and PAM-2024-3 projects, as appropriate.

The development of the BRPs will consider the relationship between MSY/MSY proxies and relevant factors such as the stock productivity, stock status, and the exploitation patterns of SIOFA fisheries. Suitable proxies for stock status and BRPs should be considered and be consistent with the operational guidelines that will be developed in project PAM-2024-01. Example case studies will be used to illustrate their implementation, including examples of different choices of BRPs for the same species or SIOFA species that are harvested in other Regional Fisheries Management Organizations (RFMOs).

The BRPs will take into consideration other Regional Fisheries Management Organizations (RFMOs) approaches, as well as any SC and MoP requirements.

As a part of this project, the consultants will present preliminary methods, draft reports and results developed during the project to an Expert Panel (see Project PAM-2024-04) and a project Advisory Panel for review, as well engage in project workshops when developing the outputs. Interim and final results will be submitted and presented to SC in 2025 and 2026 respectively.

3. Project Objectives

1. Provide analyses that will support of the development of suitable BRPs for key SIOFA fish stocks (Appendix A of the SIOFA Fisheries Overview 2024) and propose interim default BRPs for low, medium, and higher information stocks.
Specifically, evaluate the potential use of standard biological reference points, such as B40% and B20%, MSY, SBMSY, SB0, SBF=0, SB/SBMSY, SB/SBF=0, SB/SB0, F, FMSY, F/FMSY and F40%, as well as CPUE equivalents and any other appropriate reference points (e.g. as listed in Table 1):
 - a. The analysis should include consideration of target ranges, threshold regions, and limit reference points.

- b. Provide example case studies to illustrate their implementation, including examples of different choices of BRPs for the same species or SIOFA species that are harvested in other Regional Fisheries Management Organizations (RFMOs).
2. Review methods for the calculation and interpretation of risk and the quantification of uncertainties related to them. For stocks where quantitative risk analyses are not possible, provide options on how to establish appropriate default reference points and how these may be improved to be stock specific reference points.
3. Determine the conditions for when/if the BRPs would need to be revised or reevaluated (e.g., identify changes in available Information or regime shifts).

Table 1: Potential limit reference points (Reproduced from Table MI-1 in WCPFC Scientific Committee 2021).

LRP	Group	Assessment type	Comments
$x\% F/F_{MSY}$	Target & Bycatch	Data rich	Choose the level of x based on an evaluation.
$x\% B/B_{F=0}$	Target & Bycatch	Data rich	Choose the level of x based on an evaluation.
$x\% B_0$	Target & Bycatch	Data rich	Choose the level of x based on an evaluation.
SPR $x\% B_{F=0}$	Bycatch	Medium data or data poor	Choose the level of x based on an evaluation.
$x\% CPUE_0$	Target & Bycatch	Data rich or medium data	Choose the start of a reliable CPUE series and the level of x.
$B/B_{F=0, t1-t2}$	Target & Bycatch	Data rich	Choose a time period where the stock was considered in an undesirable state (and should be avoided in future) but recovered back to suitable levels.
B_{t1-t2}	Target & Bycatch	Data rich	Choose a time period where the stock was considered in an undesirable state (and should be avoided in future) but recovered back to suitable levels.
$CPUE_{t1-t2}$	Target & Bycatch	Data rich or medium data	Choose a time period where the stock was considered in an undesirable state (and should be avoided in future) but recovered back to suitable levels.
$B/B_{F=0_low}$	Target & Bycatch	Data rich	Choose a low year where the stock was considered in an undesirable state (and should be avoided in future) but recovered back to suitable levels.
B_low	Target & Bycatch	Data rich	Choose a low year where the stock was considered in an undesirable state (and should be avoided in future) but recovered back to suitable levels.
$CPUE_low$	Target & Bycatch	Data rich or medium data	Choose a low year where the stock was considered in an undesirable state (and should be avoided in future) but recovered back to suitable levels. Note $CPUE_{t1-t2}$ is more precautionary.
$F/F_{lim} > 1$	Bycatch	Data poor	Use as an interim LRP until a more reliable metric can be generated.

LRP	Group	Assessment type	Comments
F/F _{crash} >1	Bycatch	Data poor	Use as an interim LRP until a more reliable metric can be generated.

See also Table 7 from WCPFC-SC17-2021/MI-WP-08.

4. Relevant SIOFA information

1. SIOFA data (provided by the SIOFA Secretariat upon request)
2. SIOFA spatial data layers. Available at:
https://github.com/SIOFASecretariat/SIOFA_SC_Spatial_layers
3. SIOFA reporting templates. Available at:
https://github.com/SIOFASecretariat/SIOFA_Reporting_templates
4. SIOFA reports:
 - a. SIOFA SC, SC Working Group, and National Reports. Scientific Committee Meeting | SIOFA (<https://siofa.org/>)
 - b. SIOFA MoP reports. Meeting of the Parties | SIOFA (<https://siofa.org/>)
 - c. SIOFA technical and scientific reports (public reports and abstracts of restricted reports are available from <https://siofa.org/>, and full restricted reports will be made available by the SIOFA Secretariat to the project consultant upon request and after the approval of relevant CCPs.
5. SIOFA Agreement (SIOFA, 2006). <https://siofa.org/sites/default/files/documents/SIOFA-Agreement-Digital-ENG.pdf>

5. Key project indicators

1. Follow the project timeline as detailed in this agreement, including the submission of deliverables.
2. Collect any necessary data as early as possible, e.g. by submitting a data request to the SIOFA Secretariat.
3. Attend the project initialisation meeting with the project Expert Panel (composed by external experts) and Advisory Panel (composed by members of the SIOFA Scientific Committee and the SIOFA Secretariat) to discuss the project setup and development. Further engage, as requested, with the Advisory Panel that will assist the consultant(s) to access and interpret reports, data, and to provide advice on relevant analyses for the project.
4. Present preliminary results during the project, as required, to the project Expert Panel and the project Advisory Panel, and respond and revise any project outputs based on their review.
5. Provide regular (i.e. every 2-3 months), proactive updates to the Project Coordinator and the Advisory Panel throughout the project, in particular informing promptly of any unforeseen delay or variation to the project.
6. Submit deliverables on time and appropriately formatted, as required. Each deliverable will be going through a SIOFA review to ensure that it meets the quality targets and the project objectives as set out in the Terms of Reference.
7. Appropriately acknowledge the project funding source (i.e. EU), with appropriate corresponding logos in prominent positions, within each deliverable.
8. Take into reasonable account the outcomes of the SIOFA review or any comments made by meeting attendees, when revising the deliverables.

6. Deliverables

1. Attend (virtually) the project Advisory Panel meetings for Project PAM-2024-02. Additional attendance may be required at the project Advisory Group meetings for the closely related projects PAM-2024-01 and PAM-2024-03
2. Produce support materials and engage in discussions during 2 planned SIOFA Workshops (virtual) to be organized during the project timeline (tentatively Jan/Feb 2025 and Nov/Dec 2025).
3. Presentation of methods and results to the SIOFA SC annual meetings (March 2025 and 2026)
4. A Draft Report that addresses the project objectives and tasks as laid out in this contract. Revise and update the Draft Report based on review by the project Expert Panel, Advisory Group, and the SIOFA Scientific Committee. The report should follow the guidelines and format available at https://github.com/SIOFASecretariat/SIOFA_Reporting_templates. In particular, the report should include a concise (max 300 words) summary, and should detail the methods, the outcomes, conclusions, and concise recommendations. The Draft Report will also be submitted to the SIOFA Scientific Committee.
5. A Final Report that follows the guidelines and format available at https://github.com/SIOFASecretariat/SIOFA_Reporting_templates and includes any final review comments from the SIOFA Scientific Committee on the final Draft Report. The Final Report will also be submitted to the SIOFA Scientific Committee.
6. Provide all the information collected as a part of this project to the SIOFA Secretariat (including that sourced from the Secretariat) before the final payment of the contract. Such information includes electronic data files, analysis code, biological samples, and other relevant data where applicable.

Presentations of reports to the Scientific Committee may be given virtually and travel to the meetings is not obligatory. All project meetings will take place virtually. No additional travel costs will be paid.

7. Acceptance of Draft and Final Reports

1. Draft and Final Reports must be submitted in English to the Project Coordinator at the SIOFA Secretariat.
2. Draft and Final Reports will be reviewed using the procedures outlined in paper MOP-09-12 (Annex B), see also: https://github.com/SIOFASecretariat/SIOFA_Reporting_templates/tree/main/SC%20reports/Review%20template%20for%20consultant%20reports.
3. Payment of contract milestones will be subject to acceptance of the submitted reports by SIOFA.

8. Intellectual Property clause and confidentiality

The Consultant shall submit all the information collected to the SIOFA Secretariat (including that sourced from the Secretariat) before the final payment of the contract is made to the consultant.

Such information includes electronic data files, analysis codes, biological samples, and other relevant data if applicable. Any arrangements for ownership, storage, or disposal of physical samples shall be agreed by SIOFA as a part of the contract. All Intellectual Property generated as a part of this contract

shall become the property of SIOFA unless otherwise excluded in the proposal and agreed by SIOFA in the contract.

The Consultant shall not release confidential data provided for conducting this study to any persons nor any organizations, other than SIOFA Secretariat.

The Consultant shall delete all the confidential data upon the completion of the contract.

9. Work timeline and payment schedule

The funds for this project, budgeted under the SIOFA-PAM EU Grant (<https://siofa.org/eu-grants>), allow for a maximum total budget of 30,000 Euro (including all costs and any travel related expenses).

The consultant shall follow the timeline described in Table 2 below.

Table 2: Timeline for payments, milestones, and report submission

Milestone	Date	Activities
Initiation of contract	30 September 2024	First instalment payment (30% of the total contract sum)
Presentation of preliminary results	18–27 March 2025	Presentation of preliminary methods and results to the SC10 meeting (virtual)
Delivery of draft report	31 December 2025	Second instalment payment (30% of the total contract sum) upon satisfactory submission of draft report, in a format suitable for submission to SC, to the Project Coordinator.
Presentation of final results	March 2026	Presentation of final results to the SC11 meeting (virtual)
Delivery of final report	1 April 2026	Submission of final report in a format suitable for submission to SC and submission of all project information to the project coordinator. Final instalment payment (40% of the total contract sum) on acceptance of the final report by the advisory panel and the final submission of project information

10. Submission of applications

1. A current CV that summarises the applicant(s) relevant educational background and professional experience.
2. A brief proposal (indicatively 1-3 pages) outlining the proposed methods and analyses, including a description of how the objectives of the ToR will be achieved.
3. Any proposed exclusions to the intellectual property clause or variations to the work timeline and payment schedule.
4. The proposed consultancy price (including all consultant expenses and project related costs), noting that the available budget for this work indicated in Section 3.
5. Identification of any project risks and associated mitigation and management required to successfully complete the project.
6. A statement that identifies any perceived, potential, or actual conflicts of interest of the applicant(s), including those described in paragraph 4 of the SIOFA recruitment procedure (see Section 12), and
7. Any additional relevant information the applicant(s) wish to submit.

The applicants must have appropriate experience and knowledge of similar work in their portfolio.

Applications must be submitted to the SIOFA Science Officer Marco Milardi (marco.milardi@siofa.org, CC secretariat@siofa.org). Only those applications received before 12:00 PM (9:00 AM UTC) on Sunday the 8th of September 2024, Reunion Island time, will be considered.

11. Evaluation criteria for the selection of candidates

An evaluation panel, the SIOFA Secretariat, and the Chair and Vice-Chair of the SIOFA Scientific Committee will select one successful applicant for this contract. The selection criteria will include the following:

1. Adequate submission of information to allow the panel to evaluate the candidate
2. Evaluation of the proposal from the candidate, including the proposed contract price
3. Ability to undertake and complete the analyses or work required in this ToR
4. The candidate's agreement with confidentiality provisions required for the project
5. Acceptable conflict of interest statement
6. Agreement with the data submission and intellectual property terms required in this ToR, and
7. Financial and resourcing considerations.

12. Conflicts of interest. Paragraph 4 of SIOFA's Recruitment Procedure

To ensure that situations relating to potential and actual conflict of interests are avoided, persons falling into the following categories may not normally be considered for SIOFA consultancy: (i). any person designated as a designated representative or alternate representative of a CCP to the Meeting of Parties (MOP) as per Rule 3.1 of the Rules of Procedure, and to the SC and any other subsidiary bodies of the MOP, as per Rule 21.3 of the Rules of Procedure; (ii). Any person fulfilling the function of Chair or Vice-Chair of the MOP or Chair or Vice-Chair of a SIOFA subsidiary body or working group; (iii). Any person acting as a member of a delegation involved in the SIOFA decision-making process resulting in recommendations and/or approval for the SIOFA work requiring the engagement of a consultant; and (iv). Individuals who were SIOFA Secretariat staff members at the time when the recommendations and/or approval for the SIOFA works were adopted or who are members of

immediate family (e.g., spouse or partner, father, mother, son, daughter, brother, or sister) of any Secretariat staff member or of the persons identified in 4 (i), (ii), and (iii).

13. Contacts

Project Coordinator – SIOFA Science Officer (Marco Milardi, marco.milardi@siofa.org)

Administrator – SIOFA Executive Secretary (Thierry Clot, thierry.clot@siofa.org)