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Ecosystem Approach to Fisheries Implementation Monitoring Tool (EAF-IMT)

The Food and Agriculture Organisation (FAO) - Deep Sea Fisheries Project (DSF)

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Abstract

The Ecosystem Approach to Fisheries (EAF) has been widely adopted by countries and Regional Fisheries Management Organizations (RFMOs) as a framework for achieving sustainable fisheries management while balancing ecological, social and economic objectives. Several RFMOs, including the Southern Indian Ocean Fisheries Agreement (SIOFA), have incorporated EAF principles into their governance frameworks and are progressively implementing elements of the approach. The Ecosystem Approach to Fisheries Implementation Monitoring Tool (EAF-IMT), developed by FAO under the EAF-Nansen Program, provides a practical framework for assessing and monitoring progress towards EAF implementation. The tool evaluates three core dimensions of fisheries management: the ability to achieve management objectives, ecological well-being, and human well-being. It uses a structured scoring process supported by evidence and stakeholder participation to identify strengths, gaps and priorities for improvement. This information paper introduces the EAF-IMT and outlines its structure, scoring methodology and outputs. The paper highlights its potential application as a voluntary, adaptable mechanism for SIOFA Members to monitor progress towards implementing ecosystem-based fisheries management and to support adaptive management, strategic planning and reporting.

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Ecosystem Approach to Fisheries Implementation Monitoring Tool (EAF-IMT)

1. Introduction

The Ecosystem Approach to Fisheries (EAF) was developed by the Food and Agriculture Organization of the United Nations (FAO) as a practical framework for managing fisheries in accordance with the sustainable development principles embodied in the Code of Conduct for Responsible Fisheries and other international instruments (FAO, 2003). The EAF recognizes that fisheries are embedded within broader marine ecosystems and that fisheries management must balance ecological, social and economic considerations to achieve sustainable outcomes.

Over the past two decades, numerous countries and regional organizations have formally adopted EAF as a fisheries management framework or have implemented many of its core elements through their regular management processes. Several Regional Fisheries Management Organizations (RFMOs) have incorporated EAF principles into their convention texts and management arrangements. For example, Article 4(a) of the SIOFA Agreement states that "*conservation and management measures shall be adopted on the basis of the best scientific evidence available to ensure the long-term conservation of fishery resources, taking into account their sustainable use and implementing an ecosystem approach to management*".

Recent reviews of EAF implementation by RFMOs responsible for deep-sea fisheries indicate that many EAF elements are already being applied, although they are not always explicitly recognized or reported as part of an EAF framework. These reviews suggest that a structured monitoring framework could assist organizations in documenting, communicating and tracking progress towards EAF implementation (Fletcher, 2020; Thompson and Reid, 2024; Thompson et al., 2026). A recent workshop organized by the Common Oceans Deep-sea Fisheries Project (see paper MoP-13-INFO-19 for more details) highlighted that several guidelines, tools and trainings have already been developed to support EAF implementation.

One such tool, the EAF- Implementation Monitoring Tool (EAF-IMT) (FAO, 2021), adapted to and used within the specific context of the individual RFMO, could be helpful in informing internal RFMO conversations and reflections. The EAF-IMT was developed under the FAO EAF-Nansen Programme to enable partner countries and regional organizations to monitor progress with the implementation of the EAF and their achievements in managing fisheries in a sustainable manner. The tool can be used in strategic and operational planning processes for fisheries, to determine where they are making acceptable progress and where there continue to be gaps and difficulties to address.

The objective of this information paper is to briefly introduce the EAF-IMT and to present it as an available, adaptable tool to help SIOFA members in taking stock and monitoring progress towards EAF implementation.

2. Structure of the IMT

The EAF IMT is structured according to the three main risk assessment components addressed in the development of management plans following EAF guidelines (Figure 1; FAO, 2003; FAO 2012): ability to achieve; ecological wellbeing; and human wellbeing.

- "Ability to achieve" refers to the governance systems (management arrangements, plans, policies, etc.) in place to deliver the outcomes wanted. It also takes into account the external "drivers" (not controlled by the fishery) which may be affecting performance, including climate change impacts on fisheries.
- "Ecological well-being" refers to all ecological "assets" (e.g. stocks, habitats, ecosystems) relevant to the fishery and the ecosystem where it occurs, as well as the issues and impacts generated by the fishery that may be affecting them.
- "Human well-being" is defined by FAO as "a condition in which all members of society are able to determine and meet their needs and have a large range of choices to meet their potential" (Garcia et al., 2003). There are many elements to consider regarding human well-being. In the EAF-IMT they are grouped into four categories (livelihood, food and nutrition security, health and safety, and gender and equity).

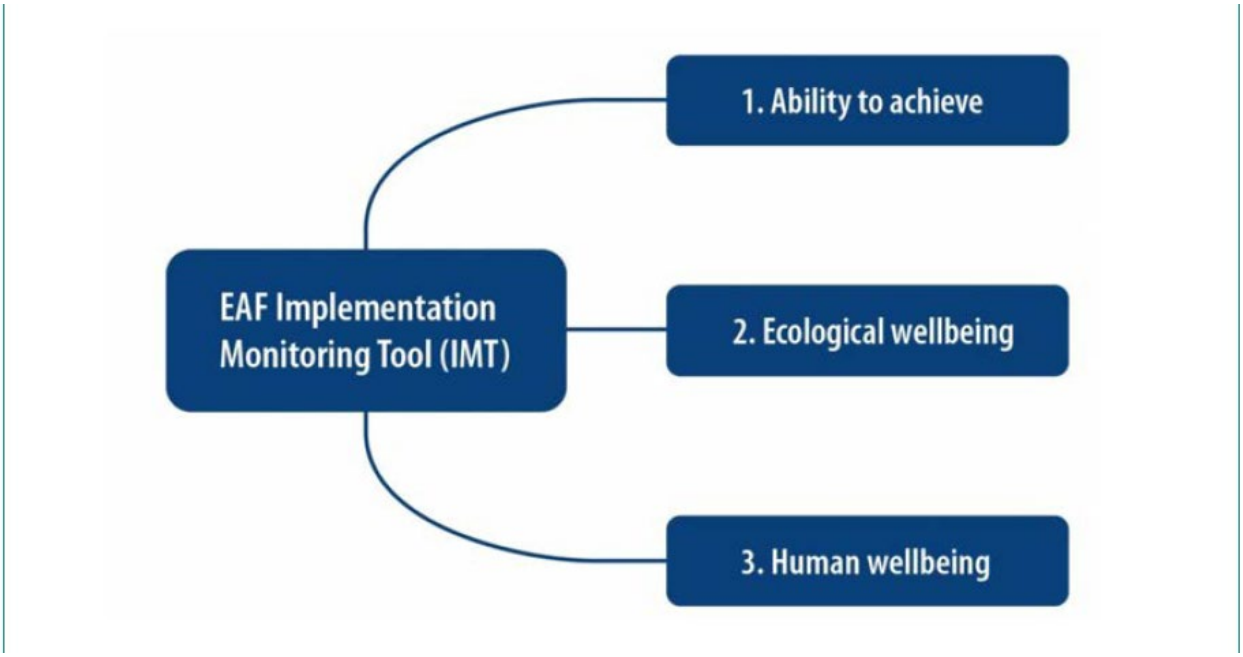

Figure 1. The three components of EAF used in the EAF IMT (FAO, 2021).

In total, the global structure of EAF IMT contains 3 components, 9 subcomponents and 30 elements to score (Table 1).

Table 1. Overall EAF IMT structure (FAO, 2021).

Dimension	Component	Sub-component	Indicator area
1. Ability to achieve	1.1 Governance		
		1.1.1	Policies and objectives
		1.1.2	Legislation
		1.1.3	Enabling regulation
		1.1.4	Consultation and participation during the management plan elaboration process
		1.1.5	Consultation and participation during the management plan implementation and review
		1.1.6	Management plan development
		1.1.7	Management plan implementation
		1.1.8	Compliance
		1.1.9	Monitoring and review
		1.1.10	Reporting and communication
	1.2 External drivers		
		1.2.1	Environmental drivers
		1.2.2	Economic, social and other external drivers
2. Ecological wellbeing	2.1 Retained species		
		2.1.1	Target species

Dimension	Component	Sub-component	Indicator area
		2.1.2	Bycatch species/group
	2.2 Non-retained species		
		2.2.1	Discards
		2.2.2	ETP species
	2.3 General ecosystem		
		2.3.1	Benthic habitat impacts
		2.3.2	Ecosystem structure and function impacts
3. Human wellbeing	3.1 Livelihood		
		3.1.1	National level
		3.1.2	Direct dependent communities: fishers
		3.1.3	Indirect dependent communities: fishworkers (including any industry processing)
	3.2 Food security		
		3.2.1	National level
		3.2.2	Direct dependent communities: fishers
		3.2.3	Indirect dependent communities: fishworkers (including any industry processing)

Dimension	Component	Sub-component	Indicator area
	3.3 Health and safety		
		3.3.1	National level
		3.3.2	Direct dependent communities: fishers
		3.3.3	Indirect dependent communities: fishworkers (including any industry processing)
	3.4 Gender and equity		
		3.4.1	National level
		3.4.2	Direct dependent communities: fishers
		3.4.3	Indirect dependent communities: fishworkers (including any industry processing)

3. Scoring a fishery

The EAF-IMT uses a set of standard scoring tables and templates to guide the process of assessing the level of implementation of each of the EAF components outlined in Table 1. Ideally, scoring a fishery against the different components should be carried out by a small group of stakeholders with relevant expertise, knowledge and experience about the fishery, including managers, scientists and stakeholders. Using the EAF-IMT scoring tables and templates, the group discusses and agrees on indicative scores for each of the 30 elements, documenting the rationale and evidence used to support each assessment.

3.1. Governance scores

The governance elements are scored directly using a single scoring table based on the extent to which these have been developed in accordance with EAF principles.

For example, in the governance subcomponent the seventh element to score is 'Management plan implementation and review'. In this example the scoring evaluates if, for the selected fishery, there is a clear set of appropriately binding management measures and arrangements (e.g. allocation of access, catch control, harvest strategy etc.) implemented and reviewed to achieve each of the agreed objectives.

The scoring table (Table 2) is used to guide discussions and to decide which score best reflects the situation of the fishery, based on the score descriptions, the scoring rationale and the knowledge and appreciation of the people in charge of the scoring of the fishery.

Table 1. Scoring table on 'Management plan implementation and review' subcomponent (FAO, 2021).

Scoring	0	1	2	3
Management plan implementation and review	A management plan has not been implemented.	A management plan has been partially implemented.	A management plan has been implemented but not reviewed.	A management plan has been implemented and reviewed.
Scoring rationale	No operational and annual work plan has been developed.	Some of the plan has operated for at least one full decision-making cycle.	The full plan has operated for at least one full decision-making cycle.	The plan has operated for at least one full decision-making cycle of the harvest strategy and its performance has been independently reviewed.

3.2. Ecological wellbeing and Human wellbeing scores

The scoring protocol for Ecological wellbeing and Human wellbeing components has three scoring categories that reflect the EAF risk-based methodology (FAO, 2021).

The first category consists in the identification and assessment of EAF issues against agreed objectives. This category (named A for assessment) evaluates if there is already sufficient understanding about the relevant EAF issues for each fishery, including having confidence in their identification and assessment of their risk levels. This category is especially relevant when initiating the implementation of EAF. Table 3 is an example of the scoring category A for the target species. The score has to reflect if there is sufficient confidence in the assessment of risk status of the target species and the associated management advice.

Table 3. Example of scoring table: Target species/scoring category A.

Scoring	0	1	2	3
Appropriate assessment completed against agreed objectives	No assessment.	Low level of confidence in the assessment and management advice.	Variable levels of confidence in the assessment and management advice for the target species against agreed objectives.	High level of confidence in the assessment and management advice for all target species against agreed objectives.
Scoring rationale	No formal or informal assessment of stock status for any of the target species.	There is some formal or informal assessment of stock status for some of the target species, but very high levels of uncertainty in the assessment and in the associated advice.	There are some of the target species or some of the objectives with an acceptable level of confidence in the assessment and advice, and other target species and objectives where the confidence level is not acceptable.	This would require: • reliable data • clear objectives • robust assessment • clear management advice.

The second category (category M for management) evaluates if management measures appropriate to risk levels have been developed and implemented. This category measures if the management procedures and systems are appropriate given the current risk levels identified for each EAF issue, and if these measures are now being implemented. This category will be more relevant to measure after the assessment phase has been completed. Table 4 is used to score if management measures appropriate to addressing the target species risk levels have been developed and implemented.

Table 4. Example of scoring table: Target species/scoring category M.

Scoring	0	1	2	3
Management measures appropriate to risk level developed and implemented	No appropriate management measures are in place.	Appropriate management measures are under development.	Appropriate management measures have been developed but are not fully implemented.	Adequate management measures have been developed and are being implemented.
Scoring rationale	There are no appropriate management measures in place or under development. Any current management measures are considered ineffective or inadequate to begin addressing the identified risks.	There are no appropriate measures in place, but processes are underway for their development.	This requires an integrated set of management measures within a suitably formalized management plan. These measures could include: • indicators • performance measures • harvest strategy • integrated set of fishing regulations (e.g. catch and effort control).	This requires both the development of the management plan but also that it is fully operational for at least one fishing season.

The third category (category AO for achieving objectives) evaluates the outcomes of the management system, and to what degree the management system is moving towards delivering each of the agreed objectives and desired outcomes (Table 5). This category is likely to be relevant and measurable after the management measures have been in place for a suitable period of time.

Table 5. Example of scoring table: Target species/scoring category AO (FAO, 2021).

Scoring	0	1	2	3
Achieving agreed objectives	No progress towards achieving objectives.	Progress towards achieving some objectives.	Progress towards achieving some objectives.	All agreed objectives are currently being achieved.
Scoring rationale	As above.	As above.	As above.	As above.

Tables like the ones described above are available for every component and category described in Table 1 (FAO, 2021).

4. Outputs

The EAF-IMT includes an Excel-based application that automatically calculates assessment results and generates graphical summaries of performance across components and sub-components. Table 6 and Figure 2 shows examples of the scoring Tables and graphic outputs for the ecological well-being component of a fishery.

Table 6. Examples of entries of the scores and calculations in the Excel spreadsheet for the Ecological well-being component of a fishery. The percentage score measures the progress made in a particular component compared to the maximum score for that component.

Ecological well-being							
		Assessment	Management	Achievement	Total	Max score	Max score if NA
Retained species	Target species	1	2	1	4	9	9
	Bycatch	1	2	1	4	9	3
Non-retained	Discards	1	0	0	1	9	3
	ETP species	2	2	1	5	9	3
Ecosystem	Benthic habitat	1	2	1	4	9	3
	Ecosystem structure	1	2	1	4	9	9
Ecological well-being total score		7	10	5	22	54	30
Ecological well-being score %		39%	56%	28%	41%		

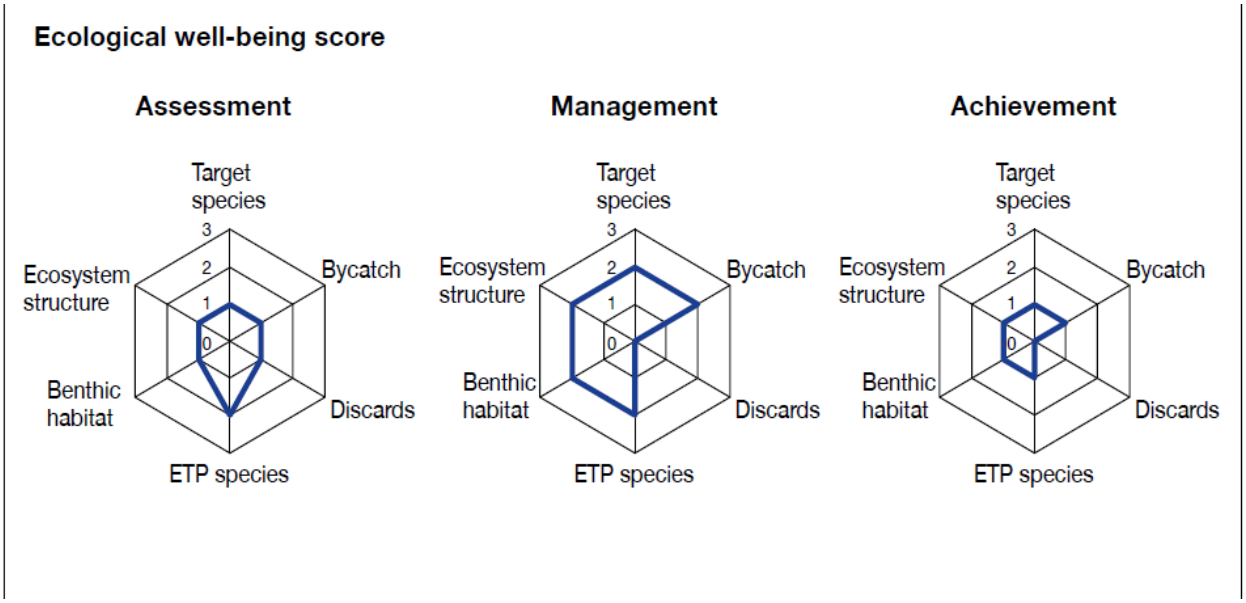

Figure 2. EAF IMT graphic output of the ecological well-being score of a fishery.

5. Final remarks

The EAF IMT is designed to generate scores, but one of the most valuable benefits of its application is the discussion that the scoring process generates and the documentation required to clearly justify each of the scores.

To monitor progress over time, it is recommended that assessments be repeated at regular intervals (e.g. every three to five years), as well as at key stages of fisheries planning and review processes. Repeated assessments can help track improvements, identify emerging gaps and support adaptive management.

The gaps and weak points identified and characterized through the use of the tool can guide fisheries managers in prioritizing actions and taking decisions in order to progress towards achieving the objectives of sustainable fisheries management.

The EAF-IMT is available as a voluntary self-assessment tool that may assist SIOFA Members in taking stock of existing EAF-related measures, identifying areas requiring further development, and tracking progress over time. The tool may also facilitate communication of achievements and challenges related to ecosystem-based fisheries management within SIOFA and contribute to broader reporting on the implementation of international fisheries commitments.

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