



FINAL REPORT

KE-MOALF-40689-CS-INDV

Development of a Baseline to Measure Project Outcomes on Governance & Management Effectiveness of Selected Priority Fisheries Using MSC Pre-Assessment Framework

CLIENT:

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KENYA MARINE FISHERIES AND SOCIO ECONOMIC DEVELOPMENT
(KEMFSED) PROJECT
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AUGUST, 2018



Acronyms and Abbreviations

ALDFG	Abandoned, lost and discarded fishing gear
BET	Big Eye Tuna
BMT	MSC Bench Marking and Tracking tool
CABs	Conformity Assessment Bodies (CABs)
CCA	Community Conservation Area
CORDIO	Coastal Oceans Research and Development in the Indian Ocean
CPUE	Catch Per Unit Effort
EAF	Ecosystem Approach to Fisheries
EAME	Eastern African Marine Ecoregion
EEZ	Exclusive Economic Zone
ERAEF	Ecological Risk Assessment of the Effects of Fishing
ETP	Endangered, Threatened and/or Protected
FAD	Fish Aggregation Device
FAO	Food and Agriculture Organization of the United Nations
FCR	Fisheries Certification Requirements
FCR	Fisheries Certification Requirements
FIP	Fisheries Improvement Project
GCR	MSC's General Certification Requirements
IOTC	Indian Ocean Tuna Commission
IUU	Illegal, unreported and unregulated (fishing)
KEMFSED	Kenya Marine Fisheries and Socio-Economic Development Project
KMFRI	Kenya Marine Fisheries Research Institute
LMA	Locally Managed Area
MCS	Monitoring, Control and Surveillance
MEY	Maximum Economic Yield
MPA	Marine Protected Area
MSC	Marine Stewardship Council
MSY	Maximum Sustainable Yield
PA	Pre-assessment
PI	Performance Indicator
PSA	Productivity Susceptibility Analysis
RBF	Risk Based Framework
SDF&BE	The State Department for Fisheries and the Blue Economy
SICA	Scale Intensity Consequence Analysis
SKJ	Skipjack tuna
TAC	Total Allowable Catch
TNC	The Nature Conservancy
UNFSA	United Nations Fish Stocks Agreement
UoA	Unit of Assessment
WWF	World Wildlife Fund
YFT	Yellow Fin Tuna

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1. PROJECT BACKGROUND

Globally, the oceans are a source of livelihoods (jobs) and stable economies for coastal communities, benefiting those who are directly employed, and also substantially provide indirect value for community identity, tax revenue, and other related economic and social aspects of a stable coastal economy. However, the relationship with the world's oceans has hardly been symbiotic and for centuries, the sea has served as both a resource to exploit and a dumping ground for our waste with significant consequences for the jobs and revenue emanating from these waters. Therefore, the emerging concept of Blue economy, that aims to harness what the oceans have to offer in a sustainable way has gained interest globally, and the Western Indian Ocean region is no exception.

In cognizance of the need for sustainable exploitation of the coastal and marine resources in face of the global shifts to a Blue Economy approach, the Government of Kenya, enacted the Fisheries Management and Development Act 2016 and through Executive Order No. 1/2016 of May 2, 2016, created the State Department for Fisheries and the Blue Economy (SDF&BE) to strengthen fisheries governance and management. Additional institutions created include the Kenya Fisheries Service, Kenya Fish Marketing Authority and the Fish Levy Trust Fund to strengthen the governance, and to promote investments in the Blue Economy. The Kenya Marine Fisheries and Socio-Economic Development Project (KEMFSED) was funded by the World Bank through the SDF&BE targets to stimulate further economic benefits from the coastal and marine resources over the next five (5) years. In recognizing the many sectors in the blue economy, Government of Kenya prioritized fisheries and aquaculture, and maritime shipping and logistic services as priority sectors that would deliver fast socio-economic benefits to the communities in the coastal areas, the Government of Kenya established The Presidential Blue Economy Committee in September 2016.

2. PROJECT RATIONALE AND OBJECTIVES

2.1 Rationale for the KEMFSED Project

A key element of project design is monitoring and evaluation which, for the KEMFSED project, will be captured in the form of a results framework. The project results framework identifies monitoring indicators for tracking outcomes and impact over the

duration of the project, with baseline values at start-of-project (SoP) and target milestones and values for end-of-project (EoP). The task of identifying appropriate indicators and establishing baselines was divided between several assignments variously contributing to preparation of different components of the project. The assignment for the **"Development of a Baseline to Measure Project Outcomes on Governance & Management Effectiveness of Selected Priority Fisheries"** was aimed at establishing a **"Baseline for KEMFSED Component-1"** focussed on the **"Status of Governance and Management of Priority Marine Fisheries"**.

In this effort, the Assignment followed the Marine Stewardship Council (MSC) certification standards. The MSC is the most widely recognized, and comprehensive framework for assessment and scoring of fisheries sustainability globally. Further, the MSC incorporates three key principles of sustainability in fisheries and marine resource management, viz. (i) Stocks status - ensuring of sustainable fish stocks for the target fish stocks for continued benefit to the resource users/society, (ii) Ecosystems - minimising environmental impact of the fishing operations and thus ensuring maintenance of the structure, productivity, function and diversity of the ecosystem on which the fishery depends, (iii) Governance -effective management where the fishery meets all local, national and international laws, and must have a management system in place to respond to changing circumstances and maintain sustainability. The MSC Pre-assessment framework includes a semi-quantitative progress monitoring tool and therefore, very well suited for measuring progress on fisheries governance under the KEMFSED project, and potentially beyond.

The identification of the priority fisheries for improvement under the KEMFSED FiP was conducted through a series of meetings between the Consultant, Client and the project supervisors prior to the start of this Assignment. A Pre-assessments of the selected priority fisheries was then conducted using the MSC Framework, using only the methodology, taking into cognisance, that certification *per se* was not explicitly an objective of the current assignment. Similarly, the methodology took into consideration the Unit(s) of Assessment (UoA) for each priority fishery and assessed any likely need for application of MSC risk-based framework (RBF), including Consequence Analysis (CA), Productivity Susceptibility Analysis (PSA), Consequence Spatial Analysis (CSA), the Scale Intensity Consequence Analysis (SICA) which is used to assess fishery impacts.

2.2 Aim and Objectives of the Current Study

The objective of the assignment was to undertake an Assessment to establish Baselines against which the impact of proposed KEMFSED project interventions on governance and management effectiveness of selected priority marine fisheries could be monitored.

The Assessment covered the entire Kenya Marine fisheries target intervention areas for the Project, including Kwale, Mombasa, Kilifi, Tana River and Lamu fisheries, the territorial seas and country's EEZ.

The specific objectives of the Assignment were:

1. Consultation with the Client to confirm / identify: -
 - i). Priority marine fisheries for improvement under the KEMFSED project;
 - ii). Ascertain whether any of the fisheries had/was currently undergoing MSC pre-assessment or was planned for assessment under other project initiatives and
 - iii). Identify any operational or other contextual information required for delivery of KEMFSED project objectives;
2. Review the MSC pre-assessment framework and consider what/if, any adaptations were needed in applying the framework to meet the stated objective for this assignment, considering the Unit(s) of Assessment (UoA) for each selected priority fishery and the likely need for application of MSC risk-based framework (RBF);
3. Undertake MSC pre-assessment for each identified priority marine fishery as guided under Objective (2);
4. Prepare/Submit a detailed Draft final report to the client, including:
 - i). Description of work undertaken including methodology;
 - ii). A pre-assessment report for each selected fishery following standard MSC pre-assessment format, including ratings against each MSC performance indicator and accompanying justifications;
 - iii). Benchmarking & Tracking (BMT) tool for each selected fishery, filled for baseline YR1 based on pre-assessment ratings;
 - iv). Recommendations for updating of the assessments for monitoring progress of each UoA under, and impact of the KEMFSED project.
5. Presentation (in PowerPoint) of Results and recommendations to the Client for comment,
6. Preparation and Submission of a Final Report (revised Draft Final Report) incorporating the comments from the client and validation workshop.

3 METHODOLOGY

3.1 Approach to the Development of Baseline to Measure Fishery Improvement

Outcomes under the KEMFSED Project

In the development of the Baseline to measure project outcomes on governance & management effectiveness of selected priority fisheries for the KEMFSED project, the consultancy employed the MSC Pre-Assessment Framework as a tool to fairly identify the precise Baselines against which the KEMFSED project Fishery Improvement Interventions (FII) on governance & management effectiveness could be measured or gauged. Consequently, the overall objective was not a pre-assessment geared towards MSC certification. Further, the assessment employed the MSC Bench-Marking and tracking tool (BMT) which, together with the baseline results, was used to identify and guide on the potential intervention areas for the KEMFSED project. In this regards, the BMT tool will be adapted for the first year (as Year-1) and the follow-up years of the project, with clear outline of the identified gaps and the associated activities that could be undertaken as intervention areas within the KEMFSED FiP while setting out clear milestones for each of the gaps, activities, and expected outputs and outcomes.

In order to deliver on the primary objective of establishing baselines for the fishery governance and management for the KEMFSED project, and taking note of the magnitude of data and information required, the Consultancy also used indigenous knowledge at community level as basis for local-level decision-making in many of the fisheries, especially from the elderly fishers who have intricate systems of gathering, predicting fishing conditions based on their deep knowledge on the marine fisheries and fishing activities. Therefore, the fishery pre-assessments endeavored to review all available knowledge from the client as well as from other stakeholders including community groups, fishers, government institutions, NGOs, Consulting firms as well as various projects on fisheries which have been implemented over the last decades such as the South West Indian Fisheries Project (SWIOFP), IOC-SWIOFish, the WB/GEF/GoK KCDP project, the IOC-SmartFish project and the Seacology project among others.

In setting up a Baseline for the KEMFSED, the Units of Assessment (UoAs), based on information available from the coastal and marine fisheries comprised the (i) Target Stocks/Species fisheries including the associated by-catch, (ii) the Fishing methods, gears and vessels including the vessel gear combinations and highlight of the interactions, (iii) Fishing fleets or vessel categories involved including foot fishers, local vessels, the semi-industrial and industrial vessels, and (iv) Geographical expanse of the fishery including the fishing grounds and fish landings sites. In the collation of data and information, the consultancy employed similar approaches to those used in previous projects including the SWIOFP, KCDP and the State Department of Fisheries & Blue Economy fishery monitoring programmes. In stocks of multiple species nature such as the small-scale tuna fisheries, efforts were made to treat the sub-stocks for entry under separate scoring

elements within the "Species" or "Fishery" as unit of assessment. Additionally, documentation of the fishing groups (e.g. longline, handlines, ring net fisheries etc.), individual fishers (especially in fisheries such as the lobster & Octopus fisheries) as well as any other peculiar priority fishery selected. The assessment also assessed all the entities involved in the management of the fisheries, both at spatial and temporal scales (especially for seasonal fisheries such as the tunas) with emphasis on the geographical scales, the institutional arrangements from different organizations; the Kenya Fisheries Service, the State Department of fisheries & Blue Economy (SDF&BE), Kenya Wildlife Service, Kenya ports Authority (especially with regards to fish landing sites cum fishing ports), Kenya Maritime Authority (with regards to fishing vessels and marine safety) among others, and management at different levels; from the State Department of Fisheries & Blue Economy, to the County Directorates of fisheries, the Beach Management Units (BMUs) and villages elders (with kaya elders on some marine/mangrove located kaya shrines), and any other parties that may be involved in the management of the fisheries and marine resources. The information is important for the project in getting to align any recommended management interventions with institutional implementations. Noting that the management of the BMUs is a mandate under the County directorates, the survey sought to understand the institutional links in the management structure from the national, regional, county and BMU levels, narrowing down to the management of the fish landings sites as well as links with other small administrative units. At the species UoA level, the survey focused on identifying the fishery intervention tasks/activities while the task of developing the fishery improvement planning were left to project team. For each established baseline with recommended interventions, all issues with reference to e.g. difficulties encountered are highlighted to guide the Monitoring and Evaluation Strategy setting for the Project taking into considerations the actual scenarios on the ground.

The pre-assessment used the MSC Fisheries Assessment Methodology (FAM) and Guidance to Certification Bodies, initially focused on the Default Assessment Tree (DAT) with recommendation for Risk-Based Framework (RBF) where data and information was limited, as outlined in the MSC FAM Version 2.1 (MSC, 2010).

The three (3) main principles of FAM used, were defined for the pre-assessment, as follows: -

- a) **Principle 1 - Sustainability of exploited fish stocks:** for performance indicators (PIs) under this principle, the survey focused on two key aspects of fishery's performance i.e.
 - i). **Outcomes:** Current status of the target stock resources; are there existing Reference points for the stocks, and/or strategies for stock rebuilding for stocks under threat of depletion, are the stocks of target species at sustainable levels;
 - ii). **Management:** existing management /harvest strategies for the selected/priority fisheries were assessed for maintainance of target species within sustainable

levels; the tools, measures or strategies used specifically to manage impact of the fishery on target species; and monitoring & evaluation systems for impacts of management strategies (data and information), and any existing efforts in stock assessment and monitoring.

- b) **Principle 2- Maintenance of the fishery ecosystem:** Five (5) key components on ecosystem elements that may be potentially impacted by a fishery were considered;
- i). **Retained species** - species landed (commercially valuable fish, taken by fishers).
 - ii). **By-catch species** – species taken incidentally, not retained (usually of no/low commercial value).
 - iii). **ETP species** - Endangered, threatened or protected (ETP) species recognized by existing legislations; Fisheries Management and Development Act 2016, the Wildlife Conservation and Management Act 2013 and international agreements e.g. Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES, 1975), the African-Eurasian Migratory Waterbird Agreement (AEWA, 1995) etc.
 - iv). **Habitats** within which the fishery operates.
 - v). **Ecosystem** – for assessing the indirect impacts of fishing on the wider ecosystem e.g. trophic structure and function, community composition and biodiversity, and the wider ecosystem impacts of retained catch removals.

To minimize the possibility of duplicate scoring, all species in the fishery were only considered within one of the components; as Retained species, Bycatch species or ETP species and used to establish the performance against which the direct impacts of fishing on the components of the ecosystem were assessed. The ETP Component considered both indirect and direct impacts.

Prior to scoring the fishery, the component under which any Principle 2 species was to be assessed was determined e.g. an ETP seabird species taken as bycatch was scored under ETP species PIs (and not Bycatch species PIs). The Management Strategy PIs (under Principle 2) only considered those management tools, measures or strategies that manage the impacts on the fishery on the specific ecosystem supporting the fishery. Other broader management and fisheries policy considerations were captured in **Principle 3**.

- c) **Principle 3 - Effective and responsible management:** focused on the existence of institutional and operational framework, appropriate to size and scale of the fishery, for implementing Principles 1 & 2 for sustainable fisheries in accordance with the outcomes articulated by the Principles. The PIs were assessed under two (2) Components;
- i). **Governance and Policy** –captured the broad, high-level context of the fishery management system of the fishery using key PIs such as legal and/or customary

framework overarching the fishery, the consultation processes and policies, and articulation of the roles and responsibilities of persons or groups of people and organizations within the management system and policies.

- ii). **Fishery Specific Management System** – looked at the fishery-specific management system applied to the selected fishery; the management objectives, decision-making processes, fishery's compliance and enforcement system and implementation, research planning and monitoring, and evaluation of performance of management system. UoAs included vessels, fishers and fishing/boat team, with management of Fishing effort (fishers, vessels or fishing teams) as subject of assessment. Other additional management arrangements e.g. small-scale purse seine fisheries were considered and reflected in the scores under the fishery-specific management system PIs.

From the evaluation the MSC principles and criteria for sustainable fishing, the consultancy based the Ecological Risk Assessment of Effects of fishing on three (3) levels (Figure 1):

- **Level 1 –MSC Principle** as described in the MSC standard,
- **Level 2 –Component**; the second level within the Assessment Tree structure,
- **Level 3 –Performance indicator**; the scoring point for the performance of the fishery governance.

The consultancy employed a combination of approaches. First, the MSC Fishery Assessment Methodology's (FAM) assessment tree was used as the default approach to the pre-assessment. Further, the Risk-Based Framework was used for evaluation and scoring specified outcome Performance Indicators (PIs) within the MSC default assessment tree. Lastly, Ecological Risk Assessment for the Effects of Fishing (ERAEF) methodology was used for assessment of the ecological impacts of fishing to carefully define the potential interventions in terms of exploitation strategies and, management plans to enhance sustainability of the selected priority fisheries. Where necessary, the Consultancy has recommended additional Risk-Based Assessment (RBAs) for fisheries with scanty data or information on some aspects of the performance e.g. stock status, ecosystem impacts etc.

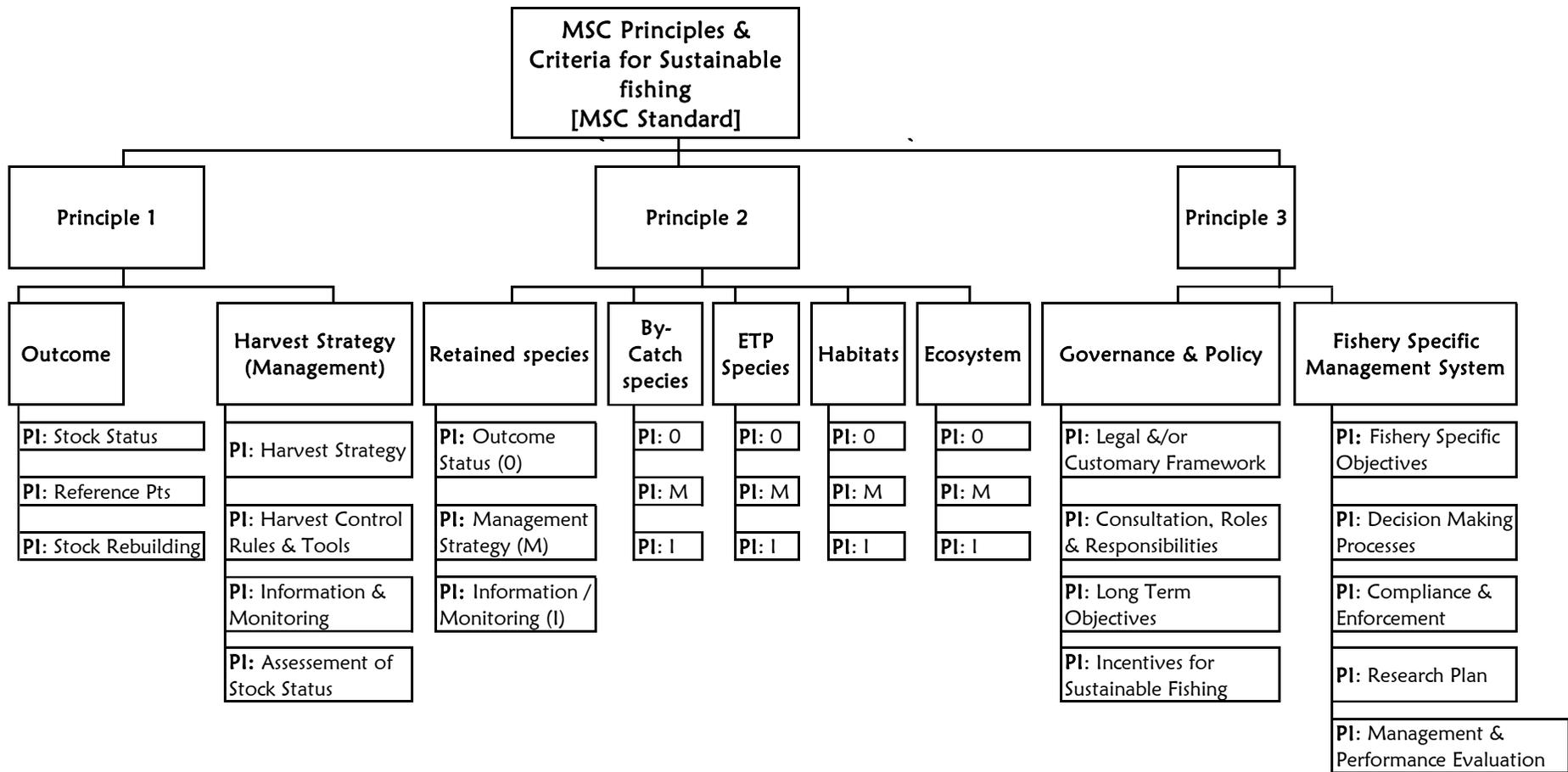


Figure 1: The MSC’s Assessment Tree Structure – Principles, Components and Performance Indicators (source: Marine Stewardship Council Fisheries Assessment Methodology)

3.2 Ecological Risk Assessment for the Effects of Fishing (ERAEF) Background

The ERA-EF methodology comprises of a set of screening or prioritization steps that work towards a full quantitative ecological risk assessment. The RBF enables scoring of fisheries in data-deficient situations, particularly for the outcome performance indicators (PIs) associated with MSC Principles as guided by the MSC Standard where use of the default scoring guideposts would not be recommended. The RBF includes a set of methods, for assessing the risk to each of the ecological components from activities associated with the fishery in assessment. These methods range in complexity and data requirements from a system based on expert judgment (Scale Intensity Consequence Analysis- SICA), to a semi-quantitative analysis to assess potential risk (Productivity Susceptibility Analysis - PSA). Each methods provides a risk-based estimate of the impact of the fishery on the ecological component addressed within the outcome Performance Indicator (or on individual elements of a given component, such as individual species). The risk estimates are in turn related to the specific scoring guideposts (SGs) used to assess the performance of the fishery against the PI for a particular component.

3.3 Benchmarking Performance of the Fisheries under the MSC framework

After the collation of data and information on the fisheries followed in developing fishery improvement projects (FIPs) for the selected priority fisheries, the Consultant will employ the MSC Fisheries Standard for benchmarking and tracking (BMT tool) the environmental performance of selected fisheries. Based on the established benchmarks, the consultant will endeavour to propose a detailed plan of action to improve performance up to the level of sustainability in consultation with the fishery managers/the client. The Standard is comprised of three core principles, namely (i) Sustainable fish stocks, (ii) Minimum environmental impact and, (iii) Effective management. In this process, ≈28 performance indicators (PIs), all grouped under each of the three principles scored using the MSC Pre-Assessment Methodology scoring.

3.4 Gap Analysis for Fishery Management Benchmarking

In the assessment of the management performance of the selected priority fisheries, the MSC pre-assessment (gap analysis) tools were adapted to evaluate the issues faced by the fishery, taking note of the likelihood of failing to achieve sustainability at the three levels; stocks, ecosystem and governance. The MSC's 28 PIs were be used to provide baseline determination of how the selected fisheries performed relative to each of the indicators within the MSC Standard to identify areas in the prioritized fisheries that need to be improvement. After establishing the baseline status for the fisheries in terms of the stocks, ecosystem and governance, and benchmarking levels established using the BMT tool, the issues in the fishery were tabulated on an issue-action plan orientation while

highlighting the challenges faced in establishing the baselines, to provide adequate data and information for the Project team for development of an action plan for management improvement. The Assessments are all reported using the standard MSC Pre-Assessment Reporting Template (Ref.: MSC Pre-Assessment Reporting Template v2.1).

3.5 Survey Approach and Data Collection

3.5.1 Stakeholder engagement process

All efforts were made to ensure that all the categories of Stakeholders; from the foot fishers exploiting the intertidal areas to commercial fishers, and from small-scale processors to exporters; government including BMUs, BMU Networks, the SDF&BE, the KeFS, the Kenya Marine & Fisheries Research Institute (KMFRI) and non-governmental organisations (NGOs) working on coastal and marine fisheries, scientists and others who play an essential role in the process and delivery of improvements in the fishery were included in the consultation. The client together with the associated institutions comprising the State Department of Fisheries & Blue Economy and County Directorates of fisheries and Beach Management Units were contacted to aid in the identification of key informants with indigenous knowledge and other critical information on the fisheries. At each step, deliberate efforts were made to ensure that all the stakeholders and their specific roles and/or areas/levels in the exploitation and/or management of the fishery resources were understood and agreed between the consultant and the client.

3.5.2 Scoping

A profile of the selected priority fisheries was developed at the scoping stage following information provided by the client on the prioritized fisheries (See Table 1, earlier). The information derived at the scoping stage was used to document the fishery characteristics (Level 1) and generate the "Units of Analysis" (Levels 2). The scoping was conducted stepwise, along four (4) key steps of the scoping process; -

Step 1 – Documentation of the general fishery characteristics of the selected priority fisheries

Step 2 – Generation of the “Unit of Analysis” lists (species, habitat types, communities)

Step 3 - Selection of objectives of the management processes

Step 4 - Hazard identification

Step-1 Documentation of the General Fishery Characteristics for Priority Fisheries

Extensive literature review and desktop analysis was used to document the general characteristics of the selected priority fisheries, with data and information mining from fishery Statistical bulletins, Catch Assessment Surveys, Project Data and Summary reports, Existing management plans for the coastal and marine fisheries, Fishbase and

WIOFish databases, Journal articles/publications, thesis documents and fisheries frame surveys among others.

Step-2 Generation of “Unit of Assessment” lists

According to the MSC Guidelines, generation of the "Unit of Assessments" is based on the certifiable units of the fishery or fish stock combined with the fishing methods/gear and practice/strategy i.e. the vessel(s) pursuing the fish of that stock. Therefore, the UoAs were identified as the target species as well as all other species impacted by the fishery, taking into consideration the multi-gear nature of majority of the marine fisheries. The State Department of Fisheries, Aquaculture & the Blue economy including its extension to the is mandated with the management of fisheries with the implementing bodies being the Kenya Fisheries Service (KeFS), County Fisheries Directorates (CFDs) and Beach Management Units (BMUs). The Kenya Marine & Fisheries Research Institute is mandated to undertake research in order to provide scientific data and information for sustainable exploitation, management and conservation of Kenya's fisheries and other aquatic resources. Kenya is a member of the Indian Ocean Tuna Commission (IOTC) which manages the stocks of highly migratory species in the Indian Ocean waters.

The UoAs in this assignment include the target stock(s), the fishing method or gear type/s, vessel type/s and/or practices, and the fishing fleets or groups of vessels, or individual fishing operators pursuing that stock. The fishing grounds/habitats, and all components of the ecosystem potentially impacted by the fishing activities including the e.g. use of bait in some fisheries, potential effects of fishing and other agents of change. Further, various attributes of the UoAs that could be affected by fishing (feedback impacts of fishing activities on e.g. population size, size composition/distribution, species composition and biodiversity as well as ecosystem services) were identified during the verification of the final UoA lists.

Step-3 Selection of objectives for the ERAEF stages

In the ERAEF process with regard to habitat and ecological community components, a set of preliminary core objectives including the need to maintain biomass above specified reference points (typically SPR values >30%), Maximum sustainable yields (MSY) at the precautionary level of $\approx 50\%$, setting of the specific geographical range of each of species, lowest limits of acceptable genetic diversity, size structure, reproductive capacity, fecundity levels and recruitment of both target, bycatch and ETP species, mitigation of impacts of fishing activities on population, maximization of survival after interactions and ensuring that the interactions did not affect the viability of the population or its ability to recover were set for consensus with the Client early in the Consultation process, incorporating Stakeholder inputs along the stages of the Assignment.

Step 4 Hazard Identification

Hazards in each selected fishery were identified based on a checklist of the potential activities associated with the fishery and fishing activities, and re-evaluated after extensive review to allow repeatability between the selected priority fisheries. Any additional activities raised by the stakeholders were included in the checklist and the background information and consultation then used to set of activities with each priority fishery. Once the data and information related to each fishery, and the associated activities, habitats and ecosystems, and governance and management structures were collated, each fishery was taken through the Benchmarking and Tracking Tool (BMT) analyses.

3.6 The Fishery Benchmarking and Tracking Tool (BMT) Approach

The BMT tool benchmarks a fishery against the MSC Standards at a particular point in time and for the duration of the period that the fishery is subject to a Fishery Improvement Plan (FiP) or management in an effort to improve sustainability. The tool was adapted for evaluation of the performance of management structures for the selected priority fisheries under KEMFSED setting the current year as baseline Year 1 for setting of M&E of the FiP targets, timelines and indicators for fishery governance and management interventions.

The BMT was used to generate an index for Project to gauge the level of the fishery towards sustainability during the management plans under the Project. For each of the scoring categories assigned to any PI, a corresponding BMT score was assigned with the generated BMT index (range 0-1) as average of all of the BMT scores assigned to the PIs. In this process, a BMT index of "1" (i.e. >80% score on all PIs) is indicative of a 'near perfect' fisheries management system with high levels of certainty about its performance & very low risk that current operations would result in detrimental impacts to the target stocks, non-target species and supporting ecosystem. On the other hand, an index of "0" (<60% scores at all PIs) is indicative of a fishery with non-conformity to the sustainability outcomes expected from fisheries management systems performing at 'global best practice' levels and hence exhibiting increased uncertainty about the long-term sustainability of the fishery. Therefore, higher BMT indices are reflective of more sustainable fisheries while very low indices suggest a fishery likely towards depletion and ultimate collapse.

In addition to the BMT indices, the tool also reports on the Number of PIs that fall into each scoring category and is therefore used to evaluate differences between fisheries with same BMT index, but different scores on the PIs in each category. At the end of the analyses, all summaries in the BMT analyses were extracted for each fishery to gauge the "Sustainability status" of the priority fisheries under the KEMFSED, marking the "Baseline status" as Year-1, with projections for subsequent years (Year 2-5) of the project. Setting the baseline provides for tracking the progress of any suggested or planned improvements to the fishery geared towards sustainability. Consequently, within identified gaps identified and issues raised, the project will identify clear action

plans and milestones for each fishery along with the expected date of attainment of the milestones within the Project period, using the Standard steps in the BMT.

3.7 BMT Index and Fishery Sustainability Reporting on FiPs

Using the baseline BMT index as year-1, the all the assessment findings and consultations should be compiled and reported at the end of the Project, with clear comparisons of the actual and expected changes in BMT index over the period of the project (from Baseline Year-1 to Year-5 including information on the scores at the Principle level (Principle BMT index) and the overall BMT index (Fishery BMT index) as a key tool for the KEMFSED Project.

3.8 Consultancy Implementation and Field Schedules

In order to deliver on the Assignment, an initial elaboration of the methodology and consultancy schedules was elaborated in three meetings; a Negotiation meeting held on the 29th May, 2018 at the Project office at Maji House, Nairobi Kenya; and two meetings for presentation of the Inception Report at the World Bank, Nairobi Offices on the 19th June, and 20th October, 2018 respectively. During the meetings, the scope of the assignment was emphasized to include “Selection of 5-6 priority fisheries and Pre-assessment of the selected fisheries to establish a Baseline against which governance and management interventions for each fishery could be measured under the KEMFSED project”. The Consultant utilized meetings with the Client, and scientists within the Coastal and Marine Fisheries to select the priority fisheries, followed by use of the the MSC Pre-assessment guidelines (as tools) to establish Baseline for each fishery using the MSC BMTs. During the Consultancy, continuous consultations were maintained with the Client in order to ensure the entire assignment remained on track.

A multidisciplinary approach was employed, with initial rapid appraisals, participatory techniques and broad-brush scoping to identify and gather data and information on the selected priority species/fisheries within the project areas of Kwale, Mombasa, Kilifi, Tana River and Lamu Counties. Comprehensive stakeholder engagements followed by Technical meetings for the BMT analyses were conducted during January through February, 2019. The input from stakeholders were mainstreamed into the bench marking process. The consultations processes and stakeholders involved are shown in Appendices.

4 SURVEY FINDINGS AND FISHERY ANALYSES RESULTS

In identification of the fisheries for MSC Pre-assessment and Bench-marking, selection of priority fisheries was conducted through series of technical meetings with fishery managers from the Kenya Fisheries Service (KeFS), State Department of Fisheries, Aquaculture and the Blue Economy (SDFA&BE) at the regional level (Coast), and Fisheries Scientists from the Kenya Marine & Fisheries Research Institute (KMFRI) June through October, 2018. As a guide, the prioritization of species/fisheries for the improvement under the KEMFSED Project was based on the following factors: -

- a) Historical aspects of the fishery including the duration in existence, spatial extent and scale (intensity; artisanal, commercial, industrial) etc.
- b) Biology of the landed species in the fishery (both target & retained bycatch) including species biology, fishery type, & associated habitats
- c) Fishery expanse; localised, regional, migratory etc. and affecting the stocks e.g. seasons, tidal regimes, bycatch in other fisheries; the fishing grounds and seasonality of the fishery in these areas? spatial migrations of the fishers?
- d) Fishing vessels, gears and methods employed in the fishery, target species, bycatch issues; challenges in species identification, limits in documentation of entire landings etc. associated with spatial distribution of landing, data leakages.
- e) Structure of the markets for the fishery; in terms of quantities consumed locally and exports, both out of the fishery to internal markets and export to international markets, distribution channels including value addition aspects, inspection, quality assurance and potential for fishery improvements
- f) Management and Legislation in the fisheries; institutional and legal structures and arrangements, regulations, monitoring/control/surveillance, any issues on compliance?
- g) Research, stock surveys, and assessment history and status, data availability, reporting structures in the fishery etc.
- h) Associated fisheries likely impacting the selected priority fishery; links with bycatch, legislation, management plans overlap, marine conservation and protected areas; with regards to possible refugia, closed areas etc.
- i) Key Stakeholders in the fishery including the fishers, traders and input suppliers, processing industries, local consumers and impacts of FiPs on these stakeholders?

Following the meetings and assessment of the various fisheries within Kenya's Coastal and Marine fisheries, six (6) fisheries were identified for improvement under the Project shown in Table 1.

The Consultancy then conducted Desktop analysis and literature review to collate data and information on the selected Priority fisheries for MSC Pre-Assessment and BMT benchmarking. The summaries of the Priority fisheries are shown in Table 2-7.

Table 1. Priority Fisheries selected for Improvement under the KEMFSED Project 2019-2023

Name of fishery	Primary Target species	Brief	Scale	Expanse
The Snapper fisheries in the North Kenya Banks	<i>Pristipomoides filamentosus</i> , <i>Etelis coruscans</i> , <i>Aprion virescens</i> , <i>Porcostoma dentate</i> , <i>Seriola lalandi</i> & <i>Epinephelus chabaudi</i>	Based on line (dropline, longline, hand line fisheries)	Small-scale	North Kenya banks are located off the Kenyan coast (latitude 2° 50" - 3° 00" S; Longitude 40° 45" - 40° 57" E) located approximately 30 nm from the nearest coastline.
Small-scale purse seine fisheries	<i>Caranx</i> spp., <i>Carangoides</i> spp., <i>Seriola lalandi</i> , <i>Gnathanodon speciosus</i> , <i>Elagatis bipinnulatus</i> , <i>Sphyræna</i> spp., Tunas, <i>Scomberomorous commersoni</i> , <i>Scomber japonicas</i> , <i>Rastrelliger kanagurta</i> , <i>Hemiramphidae</i> sp. & <i>Belonidae</i> sp.	Typically referred to as ring-net fisheries)	Small-scale, with many migratory fishers from Pemba	Fishing grounds off Vanga, Shimoni, Gazi, Likoni, Mkomani, Uyombo, Ngomeni, Mtwapa, Kilifi, Takaungu, Mayungu, Watamu and Kipini. Fishers migrate seasonally between fishing grounds
Small-scale line tuna fisheries	<i>E. affinis</i> , <i>Thunnus obesus</i> , <i>Xiphias gladius</i> , <i>T. albacares</i> , <i>Euthynnus affinis</i> , <i>T. obesus</i> , <i>Scomberomorous commersoni</i> , <i>Coryphaena hippurus</i> & <i>Acanthocybium solandri</i> .	Nearshore deep water fisheries	Small-scale tuna fisheries	Concentrated within Kwale (shimoni-pemba channel), Kilifi (Kilifi Bay, Malindi/off Mayungu), & the Lamu archipelago (Amu & Kiwayuu)
Shallow water Prawn fisheries; (critical for FiPs compared to the semi industrial)	<i>Penaeus indicus</i> , <i>Penaeus monodon</i> & <i>Metapenaeus monoceros</i>	mainly inshore coastal waters, mangrove creeks	Small-scale, but there is a semi-industrial prawn trawl fishery in Malindi-Ungwana Bay	Mainly within mangrove areas & inshore creeks, shallow muddy bank waters and the nearshore seagrass beds. All year round; NEM and SEM, though reduced frequency on reef during SEM, most activities within creeks/mangrove areas
Octopus fishery (entire coast)	<i>Octopus cyanea</i> , <i>O. vulgaris</i> & <i>O. macropus</i>	Mainly small-scale, use as lobster bait common	Small-scale; there onboard fishing by venture companies common	Kwale (Vanga-Shimoni-Msambweni-Diani) to Kilifi-Malindi & Lamu; concentrated in Vanga-Shimoni, Kilifi-Malindi and Lamu-Kiunga
Inshore/Creek basket trap fisheries	<i>Lethrinus lentjan</i> , <i>L. borbonius</i> <i>L. harak</i> <i>Siganus sutor</i> , <i>Lutjanus fulviflamma</i> , <i>Leptoscarus vaigiensis</i> , & <i>Parupeneus macronemus</i>	Typically based on traditional basket traps (<i>Malema</i>)	Small-scale, mainly inshore and creeks	Kwale (Vanga-Shimoni-Msambweni-Diani), Kilifi, Malindi/Mayungu, Gongoni/Kurawa & the Tana delta

4.1 SMALL PURSE-SEINE FISHERIES

4.1.1 FISHERY DESCRIPTION AND CHARACTERIZATION

4.1.1.1 Description of the Fishery

The small purse-seines (ring-nets) consists of a surrounding net made of nylon twine of varied lengths, widths and mesh sizes (FAO, 2001; Samoily et al., 2011). The float line consists of a rope fitted with a series of floats to enhance buoyancy, while the footrope is weighted with a shorter lead rope carrying brass or lead rings variously spaced along the foot rope or purse line is attached to the lower edge of the net. The ring-net has a central bag with a smaller mesh in which the fish concentrate during “pursing” or hauling as the two wings are hauled together. The net lengths range from <100m to large ring nets of >300m, ranging between 15-30 m wide with mesh sizes ranging between 0.25 to 11 inches. The fisheries are of great socio-economic importance to the country, forming part of wider pelagic fisheries that include the small, medium and large pelagic species. The pelagic fisheries accounts for ≈18% of the coastal and marine fishery landings, with 80% coming from shallow coastal waters and reefs, and about 20% from offshore fishing. Anchovies, sardines (*Sardinella* spp.) and small mackerels are the common species landed. In addition to being an important source of animal protein for the coastal populace, the species are used as bait in large pelagic including tuna pole and line fisheries (SWIOFP, 2012). The detailed characterization of the small purse seine fishery is shown in Table 2

Table 2. Characterization of the Small Purse-Seine Fisheries

Fishers Scale & types	The fishery occurs in relatively deeper waters beyond the reef. It is highly dominated by migrant fishers from Pemba and Zanzibar archipelago; There are no existing semi-industrial/ industrial fisheries safe for large scale purse seiners offshore
Primary major	-Carangidae, Scombridae, Sphyraenidae, Hemiramphidae, -Constitute ≈73% of pelagic species; Carangidae (8 species: <i>Caranx ignobilis</i> , <i>Carangoides ferdau</i> , <i>Carangoides gymnothetus</i> , <i>Carangoides bajad</i> , <i>Caranx sexfasciatus</i> , <i>Seriola lalandi</i> , <i>Gnathanodon speciosus</i> , <i>Elagatis bipinnulatus</i>), Sphyraenidae (3 species: <i>Sphyraena jello</i> , <i>Sphyraena forsteri</i> , <i>Sphyraena obtusata</i>), Scombridae (6 species: <i>Euthynnus affinis</i> , <i>Thunnus albacores</i> , <i>Katsuwonis pelamis</i> , <i>Auxis thazard</i> , <i>Scomberomorus commersoni</i> , <i>Scomber japonicas</i>), mackerels: <i>Rastrelliger kanagurta</i> , <i>Hemiramphidae sp.</i> and <i>Belonidae sp.</i>
Main Secondary species	Snappers (Lutjanidae), Surgeonfishes (Acanthuridae), Grunts (Haemulidae), Unicornfishes, rabbitfishes (Siganidae), Sweetlips (Haemulidae), Parrotfishes (Scaridae), Goatfishes (Mugilidae), Prawns (Penaeidae)
Bycatch species	All other reef fishes
Gear description	Main: Small purse seine/ringnets fishing is defined as the use of long continuous stretches of netting of varied lengths and mesh sizes. Small-purse

	<p>seines/ringnets are made of nylon twine of varied lengths, widths and mesh sizes (FAO, 2001; Samoily et al., 2011). A top float line or surface rope is attached to the net with a series of floats to provide buoyancy, and a shorter lead rope weighted with brass or lead rings spaced every 3-4 m along a foot rope or purse line is attached to the lower edge of the net. The rope running through the metallic rings attached to a bottom line is used for the pursing process to capture fish. Seines have a punt (central bag) with a smaller mesh in which the fish concentrate during “pursing” or hauling as the two wings are hauled together. Dimensions range from 90-300 m long, 15-30 m wide with mesh sizes normally 0.5 to 1 and a few small purse seine nets are of 2-inch mesh size.</p> <p>Other: modified reef seines, castnets, handlines are employed from the same vessels</p>
Fishing gear / Fishery interactions	Likely interactions with other artisanal fisheries when they encroach into shallower fishing grounds close to coral reefs as well as the sport fishery where both fishing activities are conducted in offshore fishing areas
Fishing vessels	Small scale purse seine fishing is conducted using motorized mashua (ranging from 7 to 13m in length). A smaller vessel may also be used to aid deployment and safety of crew at sea. The vessels, with the number of fishers ranging from 9 to more than 40 per boat. The reported fishing duration is about 5 hours per day.
Fishing grounds	The fishery occurs in relatively deeper waters beyond the reef. However, incidences of encroachment to nearshore areas have been reported resulting in conflicts
Fishing seasons	All year round, though there is reduced fishing effort in offshore fishing grounds during SEM period when most of the ring nets operate in the nearshore grounds
Fishing operations	Ring nets, made of multifilament nylon mesh, are deployed from either a single vessel or by a mother vessel and a smaller support vessel
Geographic Extend of the fishery	The main fishing grounds used for small scale purse seining include areas off Vanga, Shimoni, Gazi, Likoni, Mkomani, Uyombo, Ngomeni, Mtwapa, Kilifi, Takaungu, Mayungu, Watamu and Kipini. The fishers may migrate seasonally between the fishing grounds following the migratory patterns of their target fish species.
Fishing Effort & level of Exploitation	The frame survey results reported 22 small scale purse seine fishing vessels operating in Kenya’s waters as follows: Lamu - 0, Tana-0, Malindi- 2, Kilifi-1, Kwale-18 and Mombasa-1. The general distributions of the landings were as follows: Vanga-7, Gazi-3, Shimoni-2, Likoni-1, Mkomani-1, Takaungu-2, Kilifi-2, Uyombo-1 Watamu-2, and Kipini-2, Mtwapa-1. Currently the total number of small scale purse seine boats is 31 according to results of the marine fisheries frame survey 2014.
Catch per unit effort (CPUE)	CPUE: higher than other common gears; also requires higher fishing effort in terms of number of fishers involved per vessel; 9.4 kg/fisher/day in Gazi (Maina et al., 2008), 15.1 kg/fisher/day in Shimoni-Vanga & 15.4 kg/fisher/day in Kipini (Munga et al., 2010); From CAS data, CPUE averages

	<p>at 14.80 kg/fisher/day while routine fishery surveys show up to 18.28kg/fisher/day.</p> <p>-indications of increased CPUE in some areas, probably due to enforcement of beach seine ban in the areas</p> <p>Landings: Annual landings vary between 164 Mt to >2,850Mt/yr (KMFRI data, Draft Ringet Plan); Catch rates vary by gear Ring net 296.5 ± 38.3 & Reef seine 55.1 ± 7.7 kg/vessel/day annually; Overall total annual catch of small & medium pelagic is between 2,445 Mt to 3,194 Mt with a market value of USD 2.4 million to 3.1 million annually.</p>																																				
<p>Habitat impacts, Endangered Threatened and Protected Species</p>	<p>Issues on ecosystem/habitats: Concerned about fishing in protected marine reserves & recreational areas, destruction of fish habitats through snaring of nets on corals, fishing in marine reserves and nearshore areas & targeting of reef associated species and spawning aggregations</p> <p>There is a paucity of information of gillnet; and information of ghost fishing associated with lost fishing gear; Likely impact on targeting of spawning aggregations; Issues with threatened, endangered and protected (TEP) species particularly turtles</p> <p>Fisher Issues: Other small-scale fishers have raised concerns on sharing of fishing grounds, resulting in competition for space and gear; oversupply of fish in the market and unfair market competition & potential over harvesting of reef associated species and spawning aggregations.</p> <p>-The main concern for Sport fisheries is overexploitation of target pelagic fish species competing with recreational fishery, sharing of fishing grounds.</p> <p>Issues on ETPs: The gear is most likely to interact with sea turtles, although there is no documented evidence</p>																																				
<p>Biological data</p>	<p>-Average mean length of ≈ 45cm for Scombridae, and 11.45cm for Clupeids.</p>																																				
<p>Stock Assessment (source data, KCDP / KMFRI)</p>	<p>-Two Species <i>S. jello</i> and <i>S. obtusata</i> are currently over-fished in the inshore waters as indicated by higher current fishing mortalities than that at MSY. The current SSB of 40 Mt for <i>S. jello</i> & 49.3 Mt <i>S. obtusata</i> are much lower than the recommended 20% of SSB of 1000 Mt & 2,700 Mt, respectively, that are supposed to be maintained; It is recommended that the current fishing effort be reduced</p> <p>Summary of Stock status of major species</p> <table border="1" data-bbox="416 1608 1385 1872"> <thead> <tr> <th>Species</th> <th>F_{CURR}</th> <th>F_{MSY}</th> <th>SSB/SSB₀ at F_{CURR}</th> <th>SSB/SSB₀ at F_{MSY}</th> <th>Stock status</th> </tr> </thead> <tbody> <tr> <td><i>Sphyræna jello</i></td> <td>2.1</td> <td>1.1</td> <td>0.036</td> <td>0.133</td> <td>Below limit SSB (-21.4%); Below SSB_{MSY} (-9.7%)</td> </tr> <tr> <td><i>Sphyræna obtusata</i></td> <td>2.8</td> <td>0.8</td> <td>0.018</td> <td>0.230</td> <td>Below limit SSB (-23.2%); Below SSB_{MSY} (-21.2%)</td> </tr> <tr> <td><i>Sphyræna flavicauda</i></td> <td>0.8</td> <td>0.6</td> <td>0.137</td> <td>0.211</td> <td>Below limit SSB (-11.3%); Below SSB_{MSY} (-7.4%)</td> </tr> <tr> <td><i>Rastrelliger kanagurta</i></td> <td>1.2</td> <td>0.5</td> <td>0.072</td> <td>0.271</td> <td>Below limit SSB (-17.8%); Below SSB_{MSY} (-19.9%)</td> </tr> <tr> <td><i>Hemiramphus far</i></td> <td>0.5</td> <td>0.6</td> <td>0.262</td> <td>0.217</td> <td>Above limit SSB (+1.2%); Above SSB_{MSY} (+4.5%)</td> </tr> </tbody> </table>	Species	F _{CURR}	F _{MSY}	SSB/SSB ₀ at F _{CURR}	SSB/SSB ₀ at F _{MSY}	Stock status	<i>Sphyræna jello</i>	2.1	1.1	0.036	0.133	Below limit SSB (-21.4%); Below SSB _{MSY} (-9.7%)	<i>Sphyræna obtusata</i>	2.8	0.8	0.018	0.230	Below limit SSB (-23.2%); Below SSB _{MSY} (-21.2%)	<i>Sphyræna flavicauda</i>	0.8	0.6	0.137	0.211	Below limit SSB (-11.3%); Below SSB _{MSY} (-7.4%)	<i>Rastrelliger kanagurta</i>	1.2	0.5	0.072	0.271	Below limit SSB (-17.8%); Below SSB _{MSY} (-19.9%)	<i>Hemiramphus far</i>	0.5	0.6	0.262	0.217	Above limit SSB (+1.2%); Above SSB _{MSY} (+4.5%)
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<p>Management / Legislation / Governance</p>	<p>-The small purse-seine fishery management plan (awaiting parliament approval) has been developed to regulate the fishery. More scientific information is needed to back-up proposed management regulation.</p>																																				

	<p>-Perspectives on use of the gear are mixed among different stakeholder groups. Those supporting the gear argue that it has a high potential for increasing fish production, thereby increasing food security and enhancing the livelihoods of local fisher communities. On the other hand, those against the gear argue that many of the perceived benefits from the fishery were relatively short-term and would potentially result in longer-term negative effects such as overfishing if not well managed.</p> <p>-Interestingly, the gear is more tolerated in the south coast, particularly in Vanga, Shimoni, & Gazi and less tolerated in the north coast areas of Kilifi, Watamu, and Malindi where resource use conflicts were more intense.</p> <p>-Emerging fisheries have a multitude of uncertainties due to inadequate data, therefore precautionary and adaptive measures should be undertaken early during the developmental stages.</p>
Data & MCS	Data specific to the fishery clearly lacking, often amalgamated together with other fisheries; need for specific monitoring of the fishery during the FIPs process

4.1.1.1.1 Family Carangidae

The family contains approximately 200 different species of trevallies, jacks and scads distributed in all oceans. Some species have largely continental occurring primarily in brackish environments e.g. *Elagatis bipinnulatus*, are pelagic which are usually found at or near the surface in oceanic waters. Juveniles of some species frequently shelter beneath jellyfishes. Larger species of *Trachinotus*, *Seriola*, and *Caranx* are highly regarded sport fisheries. Nine important species comprising the trevallies, the amberjack, the Mackerels and the Rainbow runner are described below.

1. Golden travelly - *Gnathanodon speciosus*

The golden travelly *G. speciosus* (Kolekole in local name) is cosmopolitan and supports small-scale fisheries in the coastal Kenya, and other tropical regions of the Indian and Pacific Oceans (Robins et al., 1992). Adults occur in deep lagoons and seaward reefs where they feed on crustaceans, invertebrates and small fishes. Juveniles live among the tentacles of jellyfish. The landings are normally marketed fresh, salted or dried and are an important fishery along the entire coastal marine fisheries.

They are diurnal, with spawning aggregations at night. In the Indian Ocean and Kenya's coastal waters, spawning occurs in April and May, with defined peaks in recruitment of juveniles into the local fishery during September and October. They breed via broadcast spawning at night in time with the moon cycles, just before and just after the full moon. They grow to upto lengths of 120 cm and can weight up to 15 kg. Due to this large size and quick reproductive rate, they are often targeted by industrial fisheries and sport fisheries placing huge competition for resources with the small-scale fisheries.

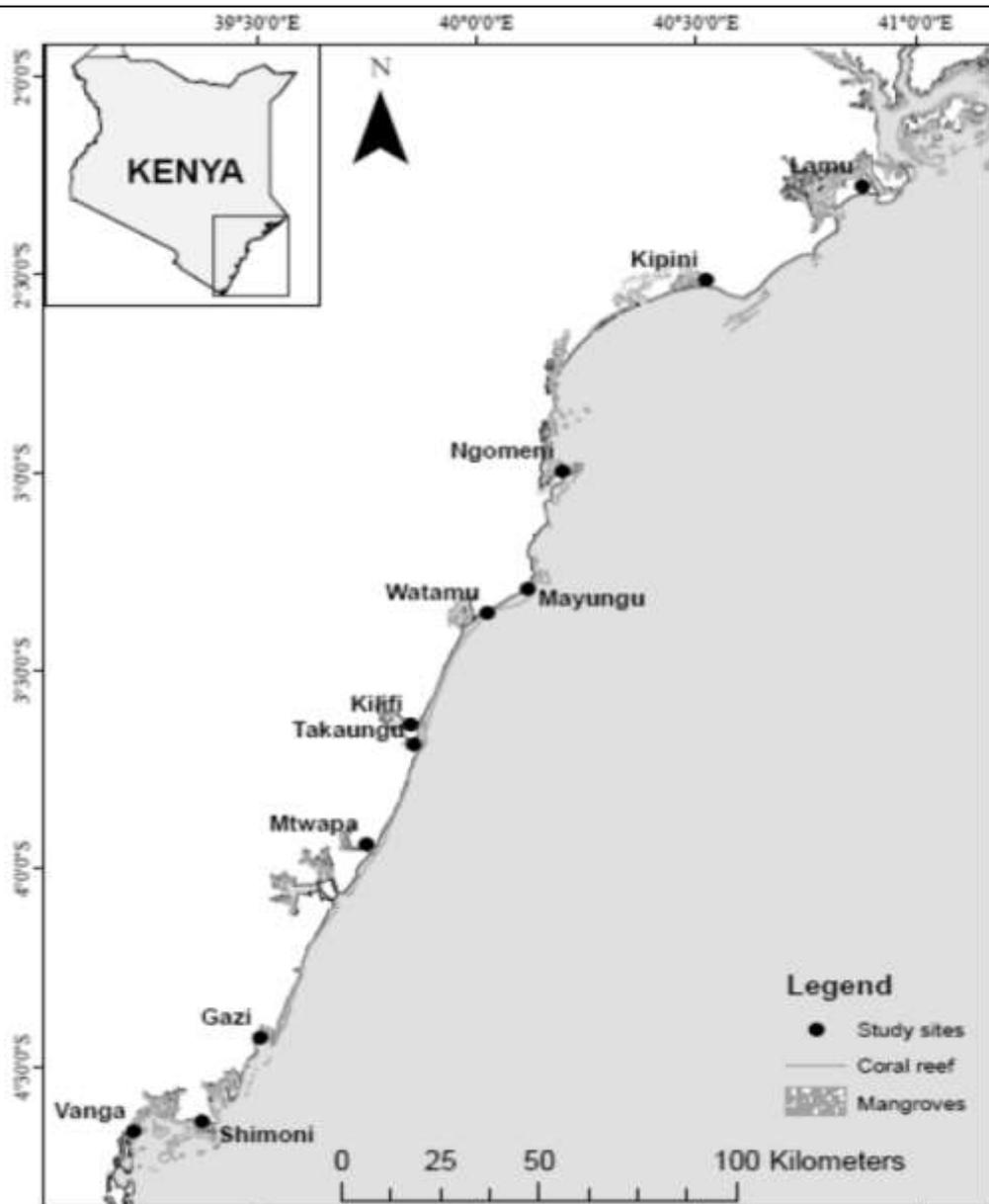


Figure 2: Major Landing sites of the Small purse-seine, and the wider Small and medium pelagic fishery in Kenya coast (source: Government of Kenya, 2013)

2. Giant trevally - *Caranx ignobilis*

The giant trevally, *C. ignobilis* (Karambazi / Kolekole in Swahili) are carnivorous fish and independent predators in most of the habitat. Young ones feed mainly on juvenile of sardines, anchovies and other fin fishes, prawns, crab stars and amphipods in shallow coastal waters. Major components of the adult food are other carangids, silver bellies, thread fin breams, goat fishes, lizard fishes, crabs and prawns. The species exhibits sexual dichromaticism (Von Westernhagen, 1974) where males appear darker than females. Giant trevally travel long distances to breed in large numbers with spawning sites located at the outer edge of fringing reefs or near reef passages, as waters become warmer, often synchronized with moon cycles. Like other members of the family, the

Giant trevally shows broadcast spawning. The larvae drift in the sea for periods often greater than a month with low survival rates; <1% of the juveniles survive to the 2-5 years that it takes to become a mature adult.

3. Yellow-tail Amberjack - *Seriola lalandi*

The yellow tailed kingfish *S. lalandi* (commonly referred to as Yellow-tail Kingfish) inhabit rocky reefs and adjacent sandy areas in coastal waters, from shallow water down to depths of around 50 m (Kailola, 1993). Schools of juveniles are generally found in offshore waters, often near or beyond the continental shelf preferring warmer waters. Adults feed on small fish, squid and crustaceans. The species attains lengths up to 250 cm and can weigh up to 70 kg. Females mature at ≈ 75 cm TL with spawning occurs mostly between November to January (Poortenaar et al., 2001).

4. Blue Trevally - *Carangoides ferdau*

The blue trevally, *C. ferdau* (Karambezi / Kolekole) is a fast-swimming predator which often forms small schools, and feed on a variety of small mackerel and filefish, crustaceans including prawns, crabs, and sea lice, soft molluscs, and other soft prey that are abundant in the lagoon. The species inhabits waters to depths of 60 m, along reefs, beaches, lagoons, and areas with sandy substrates. Adults are found in coastal waters adjacent to sandy beaches. The species is in constant abundance all year, but information regarding the reproduction and growth of the species is scanty in the marine fisheries of Kenya. However, larvae of the species are known to appear during February in the waters off Taiwan, suggesting a December spawning period.

5. Rainbow runner - *Elegatis bipinnulata*

The rainbow runner, *E. bipinnulata* (Songoro in Swahili) is circumtropically distributed throughout the Indian and Atlantic Oceans inhabiting the <15m depth surface waters, over coral and rocky reefs. It feeds on crustaceans, small fishes and squid. There is predominance of maturing/mature females from January to May in the coastal waters, (higher gonadosomatic indices) confirming a greater reproductive activity during this period of the year. Spawning is synchronous and the species is characterized as a batch spawning. Adults grows up to 180 cm, but common sizes are ≈ 80 cm, reaching ≈ 17 kg body weight.

6. Orange spotted Trevally - *Carangoides bajad*

The orange-spotted trevally *C. bajad* (Karambizi in Swahili) is fairly common in the coastal waters inhabiting inshore reefs. The trevallies are strong swimming predators, taking a variety of small fish, nekton, and crustaceans. They reach sexual maturity ≈ 25 cm long, with maximum sizes of ≈ 55 cm, and are oviparous. The main spawning periods occur between June and September. The species is occasionally taken by fishermen throughout its range, and is generally considered to be bycatch.

7. Blue Trevally - *Caranx sexfasciatus*

The Bigeye Trevally, *C. sexfasciatus* (Karambazi in Swahili) inhabits coastal and oceanic waters associated with reefs in the pelagic region at <100m depths. It grows to ≈85 cm TL with sexual maturity at 42 cm length. They are often seen in large schools during the day and solitary at night when feeding. Juveniles may be encountered in estuaries. They feed mainly on fishes, squids and crustaceans. They are marketed fresh, dried or salted and frozen. Spawning occurs in large aggregations generally between July and March. The juveniles inhabit either inshore estuaries or live pelagically around floating objects.

8. Spanish Mackerel - *Scomberomorous commersoni*

The Spanish Mackerel *S. commersoni* (Nguru-mtwane) is an important species within the small and medium pelagic fishes and a key target of the small-scale purse seines. The adults are mainly pelagic often mixing with other species of the genus, including *S. semifasciatus* and *S. queenslandicus*. Spawning is seasonal and occurs in oceanic conditions on reef edges, protracted in the warmer waters of the tropics. The larval stages are solitary, staying in own species-specific groups. Many of the fisheries that target this species are based on pre-spawning feeding aggregations. In general, spawning is associated with higher water temperatures that promote optimal food availability for the rapid growth and development of the larvae. As the young larvae grow, they move from the offshore spawning grounds to inshore and estuarine habitats. In the inshore environments, they feed mostly on the larvae and juveniles of small fish and crustaceans until they become large enough to eat small fish and squid. They mature at ≈2 years with TLs of ≈80 cm.

Other Mackerels

Other mackerels of focus within the coastal and marine fisheries of Kenya include the Indian mackerel *Rastrelliger kanagurta* (Swahili; Kibua), an epipelagic and neritic species occurring mostly at 30m depths (20-90m range), the halfbeak *Hemiramphus far* (Swahili: Chuchungi / Mususa), a brackish, marine and a reef-associated species occurring in shallow waters (≈6m deep); and the Flat needlefish *Ablennes hians* (Swahili: Kanda) which inhabits neritic and oceanic water but is also found near islands estuaries and coastal rivers, at depths up to 12 m.

4.1.1.1.2 Family Sphyraenidae (Barracudas)

The family Sphyraenidae is comprised of voracious fish predators found in all tropical and warm-temperate seas. They frequently occur in small to large schools, but the adults are usually solitary. Within the marine fisheries, the focus is on three (3) key species; the pickhandle barracuda *Sphyraena jello* (Swahili: Mzia), the bigeye barracuda *Sphyraena forsteri* (Swahili: Msusa) and yellowtail barracuda *Sphyraena obtusata* (Swahili: Msusa).

1. The Pickhandle barracuda - *Sphyraena jello*

The species is usually associated with the coastal waters (marine/brackish) mostly inhabiting current-swept lagoons and seaward reefs at 20m to 200m water depth. This fish is solitary and forages diurnally other fishes and squids. It spawns once a year with peak seasons in April and May, often extending to June and July. Spawning migrations to protected area nearshore are common, and females spawn into the open ocean.

2. Bigeye barracuda - *Sphyraena forsteri*

The species lives and feeds on or near the coral reefs and lagoons, at <300m water depth. It forages nocturnally, feeding on fishes, penaeid shrimps and squids. It is nocturnal, occurring in large schools during the day. Like the other barracuda, *S. forsteri* spawns once a year, at the edge of the continental shelf. Eggs drift inshore where they develop in mangroves, seagrass beds, or other sheltered nursery areas. The young ones in due course, move offshore to coral reefs and become semi migratory in the deeper waters.

3. Yellowtail barracuda - *Sphyraena obtusata*

The species inhabits bays, estuaries coastal and outer reefs at depths of ≈5m to 200m. It exhibits a diurnal behavior and the mainly feed on small fishes of other species. Schooling occurs in seagrass and the rocky reefs. The species mature at ≈20 cm TL. Spawning occurs during October through March with the peak during November to December and the *S. obtusata* is a multiple spawner.

External factors affecting the stock

Kenya's small purse-seine fisheries are greatly influenced by numerous factors ranging from weather patters (tides, monsoons), fishing gears and crafts, as well as other social and economic issues including cultural fishing patterns etc. The fishery is mainly small-scale and subsistence and employs mainly small, non-motorized crafts including outriggers, dhows and planked boats. Due to this limitation, the fishing effort is mainly constrained within the reef, with very few vessels venturing outside the territorial waters. Consequently, the nearshore reefs are heavily exploited.

4.1.1.2 Management of the Small Purse-seine Fisheries

4.1.1.2.1 National and International Conventions and Agreements

The coastal and marine ecosystems comprise habitats and species of fauna and flora that overlap between County and international boundaries (e.g. coral reefs, mangroves, and intertidal habitats of the continental shelf). Further, some species of the small purse-seine fisheries, as well the fishers, are migratory over large dispersal ranges beyond national boundaries. Therefore, the management of these resources are governed by both National and international legislations. The National arrangements include: -

- a) The Fisheries Management and Development Act No35 of 2016
- b) The Constitution of Kenya 2010
- c) Kenya National Oceans and Fisheries Policy 2008

- d) Maritime Zones Act
- e) Wildlife Management and Conservation Act 2013
- f) Kenya Maritime Authority Act
- g) The County Governments Act 2012
- h) The Inter-Governmental Relations Act, 2012
- i) BMU Regulation 2007
- j) The Strategy for the management of the small and medium pelagic fishery (2013)

The international arrangements include: -

- a) United Nations Convention on the Law of the Sea (UNCLOS, 1982)
- b) The Convention on Migratory Species (CMS)
- c) Convention on Biological Diversity (CBD)
- d) The FAO Code of Conduct for Responsible Fisheries (FAO- CCRF)
- e) Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES)
- f) The Nairobi Convention

4.1.2 SMALL PURSE-SEINE FISHERY PRE-ASSESSMENT RESULTS

4.1.2.1 Principle 1: Sustainability of Exploited Fishery stocks

Annual landings in the wider small & medium pelagic is \approx 2,445 - 3,194 Mt with the small small purse seine fisheries accounting for $>80\%$ of the catch. Catch rates range \approx 258-330 kg/vessel/day and the fishery is valued at $>$ USD 2.4 million annually. Gauged from the limited data available, the fishery stocks are heavily exploited and probability of recruitment overfishing is high. Stock assessments on small & medium fisheries indicate very low biomass levels ($<20\%$) in the target species; SSB_{CURR}/SSB_0 of 0.137 for *S. flavicauda* and 0.072 for *R. kanarguta*, and 0.036 for *S. jello* and 0.018 for *S. obtusata*, primary major species. The current fishing effort (F_{CURR}) is 1.3-2.4x the effort at MSY (F_{MSY}) for target species and 2.0-3.9x for primary major species species. Despite the high fishing effort and low biomass levels, there are no stock re-building strategies in place for the fishery. Fishery management should therefore set stock re-building strategies with clear timeframes to achieve the same, and gear the fishery towards recovery.

There is a small purse-seine (Ring net management draft plan) awaiting gazettelement. However, the plan has no limit-reference points nor the required triggers for action in controlling fishing effort and exploitation rates. Similarly, there are no designed harvest control rules (HCRs) specific to the small purse-seine fishery, but clear regulations on gear restrictions, fisher and craft licensing, onboard observers, catch-effort monitoring, restrictions to fishing within MPAs, CCAs, near FADs etc are well defined in the wider Fisheries Law of 2016. The legislations are continuously reviewed and improved at various levels including BMUs, licensing structures, Counties etc. There is routine monitoring of the fishery by KeFS & County Fishery Directorates with clear licensing plans and reporting structures for the fishers including migrant fishers and GPS tracking

has been contacted to map out the fishing grounds of the small purse seine fisheries. Generally, removals of the small purse seine fishery species from other fishery types is available and can comprehensively be collated with some additional monitoring efforts.

Some stock assessments on the species of the small purse-seine fisheries have been conducted taking into account fishing grounds, species, biology, effort, catch, size class analysis etc. However, more detailed analysis is needed for all species in the fishery using longer time-series data.

Table 3. Small Purse Seine Summary Conservative scores for Principle 1 PIs

P1	Outcome	1.1.1	Stock status	60-79
		1.1.2	Stock rebuilding	<60
	Management	1.2.1	Harvest strategy	<60
		1.2.2	Harvest control rules & tools	<60
		1.2.3	Information & monitoring	60-79
		1.2.4	Assessment of stock status	≥80

4.1.2.2 Principle 2: Maintenance of the Fishery Ecosystems and Habitats

The *S. Jello* and *S. obtusata* were assessed as the primary major species with *sardinella gibbosa*, *carangoides armatus*, *H. hemeralis* and other *sardinella spp.* as the primary minor. The families Carangidae, Sphyraenidae, Scrombidae and Mackerels were assessed as the secondary species. The UoAs for the primary species outcome scored <60 suggesting that the main primary species stocks are likely below the levels that would impact productivity and recruitment. Some stock assessments have been done for five species (3 target, 2 primary). However, the information is inadequate and more detailed stock assessments especially for the primary species, including detailed RBF for both the primary species and secondary species. Detailed quantitative analysis especially on the stock status of minor species, landings, biology etc. is required for the comprehensive management of the Ring net management plan. There is also a need to conduct more regular CAS data surveys, fishery surveys, routine monitoring etc. The fisheries law (2016) has measures on mesh size regulations for the small purse seine, but there is a need to enact and enforce the Ring net fishery management which encompasses the EAF approach. international/national requirements are available to assess effects of the UoA on population/stock within national or international limits especially with regards to ETPs, but quantitative information on the effect of the fishery is lacking. Some management strategies are in place, though not specific to the fishery e.g. Sea turtle Action plan, Wildlife Act, Fisheries Act, IPOAs etc and the existing legislative structures would suffice for the fishery, based on information from other fisheries such as the trawl, purse seines and other fisheries in the WIO. Information is lacking for assessment of impacts on ETPs and may be evidently inadequate to guide the

design of a management strategy for ETPs. The gears and fishing methods employed are unlikely to have deleterious impacts on the habitats to irrecoverable states based on the commonly encountered habitat whose distribution is broadly understood with some mapping conducted during the KCDP project. However, a detailed RBF is required to assess interactions between ETPs and the small purse-seine fisheries.

Table 4. Small Purse Seine Summary Conservative scores for Principle 2 PIs

P2	Primary species	2.1.1	Outcome	60-79
		2.1.2	Management strategy	>80
		2.1.3	Information/Monitoring	60-79
	Secondary species	2.2.1	Outcome	<60
		2.2.2	Management strategy	<60
		2.2.3	Information/Monitoring	<60
	ETP species	2.3.1	Outcome	<60
		2.3.2	Management strategy	<60
		2.3.3	Information strategy	<60
	Habitats	2.4.1	Outcome	60-79
		2.4.2	Management strategy	60-79
		2.4.3	Information	60-79
	Ecosystem	2.5.1	Outcome	60-79
		2.5.2	Management	60-79
		2.5.3	Information	<60

4.1.2.3 Principle 3: Effective and Responsible Management of the Fishery

There are legal systems in place to ensure sound management of the small purse seine fishery, ranging from the Ring-net Management Plan, the Fisheries Management and Development Act 2016, the BMU (2016) regulations which show clear mandate to commit legal rights to resource users. Under these arrangements, there is a systematic collection of monitoring data is ongoing in place etc. There are structured systems for dispute resolution in the law, respect for legal rights to resource use, and all regulations. However, despite all regulations being explicitly defined and well understood for key areas of responsibility & interaction as per legal framework including the Wildlife Act for ETPs, EMCA (2012) for environmental issues etc. some flaws are evident in the implementation. Consultation processes are in place, but there is a need to regularize and schedule, based on time frames geared to inform management system. The Fisheries Law (2016) emphasizes EAF approach to management at standards defined in international agreements such as UNCLOS, IOTC, the IPOAs etc. In addition to the Draft management plan that is awaiting gazette, several co-management plans in

place or in final stages of drafting such as the Shimoni-Vanga, Kuruwitu Malindi-Ungwana Bay, Malindi-Watamu Biosphere, Pate-Kiunga Conservancies plans among others. Therefore, despite the low level of implementation and lack of concerted monitoring, control and surveillance, the required legal and institutional frameworks are in place for sound management of fisheries.

Table 5. Small Purse Seine Summary Conservative scores for Principle 3 PIs

P3	Governance & policy.	3.1.1	Legal &/or customary framework	60-79
		3.1.2	Consultation, roles & responsibilities	>80
		3.1.3	Long term objectives	>80
	Fishery specific management system	3.2.1	Fishery specific objectives	60-79
		3.2.2	Decision making processes	60-79
		3.2.3	Compliance & enforcement	60-79
		3.2.4	Monitoring & Management	<60

4.1.3 SMALL PURSE-SEINE FISHERY BMT TOOL ANALYSIS RESULTS

The MSC's Benchmarking and Tracking (BMT) Tool was used to benchmark the small purse seine fishery based on the MSC Fisheries Standards for sustainability, with the assessment year set as Baseline Year-1 to guide M&E under the KEMFSED project timelines and indicators for governance and management interventions. For each of the scoring categories assigned to any performance indicator (PI), a corresponding BMT score was assigned with the generated BMT index (range 0-1) as average of all of the BMT scores assigned to the PIs. In the benchmarking process a BMT index of "1" (>80% score on all PIs) is indicative of a 'near perfect' fisheries management system; one that has high levels of certainty about a fishery's performance & very low risk that current fishing activities would result in detrimental impacts to the target stocks, non-target species and supporting ecosystem. On the other hand, an index of "0" (<60% scores at all PIs) is indicative of a fishery with non-conformity to the sustainability outcomes expected from fisheries management systems performing at 'global best practice' levels, and thus confers increased uncertainty about the long-term sustainability of such a fishery.

In the small purse seine fisheries, results show that only three (3) Performance indicators (PIs): Assessment of stock Status (P1.2.4), Governance issues on Consultation, roles and responsibilities (P3.1.1) and Existence of long term objectives for the fishery (P3.1.3) scored ≥ 80 while 13 PIs scored <60, and 12 PIs scored 60-79. The detailed Pre-assessment results for Small Purse-Seine fishery using MSC Sustainability Criteria are shown in the Appendix 1.

The overall BMT score for the fishery is 0.32, an indication of a fishery with non-conformity to the sustainability outcomes and increased uncertainty about its long-term sustainability. The score for Principle 1 is 0.33; P2=0.20 & P3=0.57, hence the design of FiPs under the KEMFSED Project should put more emphasis on gearing the fishery stocks to sustainability and Maintainance of the ecosystems supporting the fisheries. The results of the Fishery BMT analysis results are shown in Figure 3 while the projected benchmarking for the fishery over the five (5) year period (2019-2023) is shown in Figure 4. The full MSC’s BMT tool Baseline results and 5-year projections for Small Scale Purse Seine Fishery are shown in Appendix 2

Fishery Name:	SMALL-SCALE PURSE SEINE	Unit of Assessment		
		Species	Area	Gear type
FIP provider:	KEMFSED	<i>Caranx spp.</i>	KWL, KLF, LMU	Small scale purse seine
Pre-assessment undertaken by:	DR. BERNERD M. FULANDA	<i>Carangoides spp.</i> , <i>Sphyraena spp.</i>		
Action plan undertaken by:		<i>Scomberomorus spp</i>		
BMT undertaken by:	DR. FULANDA / KEMFSED TEAM			
Date of BMT:	12th MARCH, 2019			

Actual BMT index summary table
Last update: Year 1

Scoring Level	All PIs	Principle 1 Number of PIs	Principle 2 Number of PIs	Principle 3 Number of PIs
≥80	3	1	0	2
60-79	12	2	6	4
<60	13	3	9	1
BMT Index	0.32	0.33	0.20	0.57

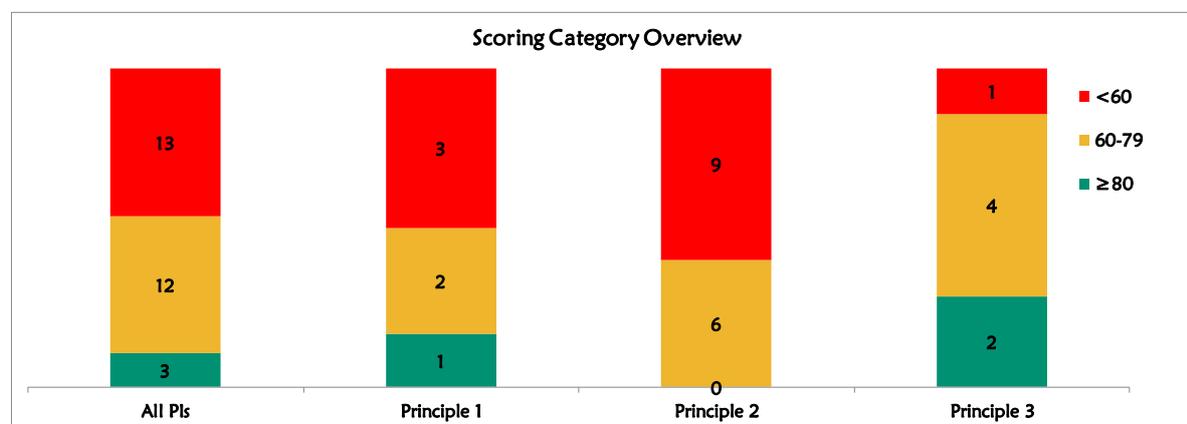


Figure 3. MSC’s BMT Tool Results for Sustainability of the Kenya Marine Small Purse-seine Fishery

Actual vs. Expected BMT index table

		BMT Index				
		Year 1	Year 2	Year 3	Year 4	Year 5
Principle 1	Actual	0.33				
	Expected		0.33	0.42	0.75	0.75
Principle 2	Actual	0.20				
	Expected		0.27	0.40	0.63	0.80
Principle 3	Actual	0.57				
	Expected		0.57	0.57	0.86	0.93
Overall	Actual	0.32				
	Expected		0.36	0.45	0.71	0.82

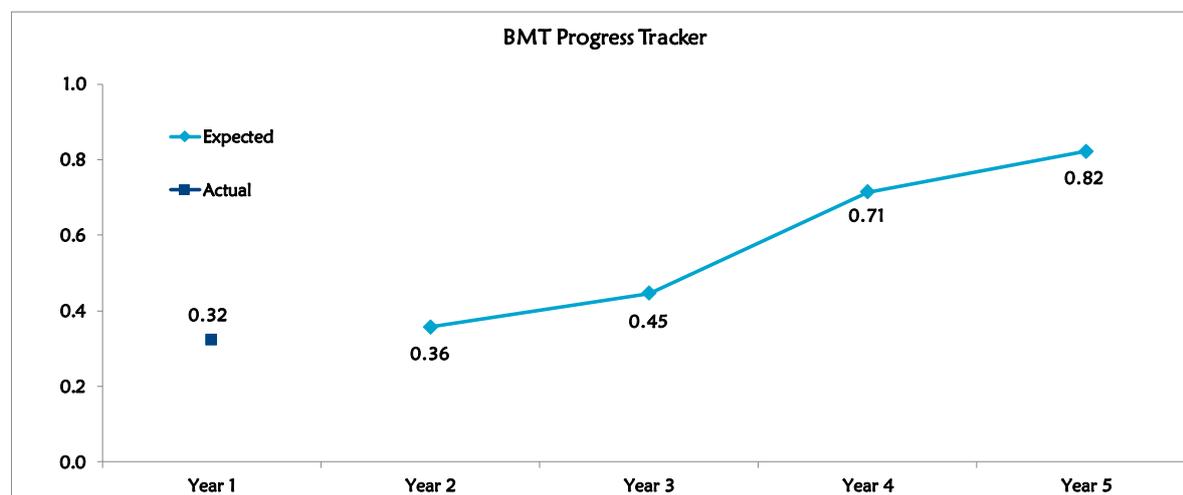


Figure 4. MSC’s BMT Tool Forecast for Improvement of the Kenya Marine Small purse-seine Fishery

4.1.4 CONCLUSIONS AND RECCOMENDATIONS

Based on BMT index, the snapper fishery faced with lack of adequate information with regards to the performance of the fishery in relation to other interactions including habitats, ecosystems, primary and secondary species; scanty data on stock assessments of the main primary species; the lack of a defined monitoring and evaluation system were the main indicators that contributing to the poor performance of the fishery. However, governance and management structures are in place and only needs to be targeted to fishery specifically. For the target *S. jello* and *S. obtusata* species, efforts should be impressed on formulating a stock rebuilding strategy with defined time frameworks and harvest control strategy. Proposed actions for the small purse seine fishery under the KEMFSED project should put more emphasis on promoting research on the interaction of the fishery with other species and supporting ecosystems. A Risk-Based Framework should be implemented especially for the interaction of the fishery with ETPs, and an effective monitoring and evaluation system specific to the fishery enacted, incorporating well defined harvest strategy with timeframes for both the target and primary species. The current Draft Ringnet Management Plan should be thoroughly reviewed, implemented and effectively enforced for targeted management of the fishery. Stock assessment for *S. jello* and *S. obtusata* should be emphasized to guide stock monitoring and evaluation for performance of the species with defined reference

points. Under MCS, non-compliance to gear regulations should be redressed to mitigate impacts of recruitment over-fishing evident in the fishery e.g. incentives for compliance with regulations. Specific focus on the 13 PIs that performed dismally (<60) in the assessment followed by the 12 PIs scoring 60-79, it is anticipated that the KEMFSED project FiPs can steer the fishery to sustainability.

4.2 SMALL-SCALE LINE TUNA FISHERIES

4.2.1 FISHERY DESCRIPTION AND CHARACTERIZATION

4.2.1.1 Description of the Fishery

The pelagic tuna and tuna-like fisheries support both small scale and industrial fisheries. However, for this assessment, guided by the limits for interventions on FiPs, the focus was on the small scale tuna fisheries. The tuna fisheries of the Kenya marine waters are comprised of several species including the Kawakawa *Euthynnus affinis*, Bigeye Tuna *Thunnus obesus*, Yellowfin, *Thunnus albacares*, Albacore *Thunnus alalunga* and Skipjack tuna *Katsuwonus pelamis*. The tuna-like group is comprised of billfishes (Istiophoridae) including marlins (*Makaira* spp.), sailfish (*Istiophorus* spp.), and swordfish (*Xiphias gladius*) which are the mainstay of Kenya's sport-fisheries. The local governance of the marine fisheries is based at County levels extending down to Beach Management Units (BMUs) in Kwale, Mombasa, Kilifi, the Tana Delta and Lamu. In the analysis of the UoAs for this fishery, three tuna species were considered; *E. affinis* (accounts for 28.6% of the catch); Bigeye tuna *Thunnus obesus* (26%), Yellowfin tuna *Thunnus albacares* (19%). The Swordfish *Xiphias gladius*, though not a tuna, accounts for 24%. The main secondary species were *Acanthocybium solandri* (11.1%); *Coryphaena hippurus* (8.9%) and *Scomberomorus commerson* (9.2%). The main gears used include long line hooks, gillnets, monofilament nets and artisanal trolling lines. Generally, the fishery is highly seasonal, with peak in the SEM season period of July-November, targeting the migratory tuna in the coastal waters. The peak season for sailfish fishery is November to March. The detailed characterization of the fishery is shown in Table 6.

Table 6. Characterization of the Small-Scale Tuna Fisheries

Fishers Scale & types	Small-scale, mainly nearshore deep water fisheries using hooks and lines; concentrated within the Shimoni-Pemba channel, Kilifi Bay, Malindi and off Mayungu, and the Lamu archipelago in Amu and Kiwayuu islands
Primary target species	The main species are Kawakawa <i>E. affinis</i> 28.6%; Bigeye tuna <i>Thunnus obesus</i> (26%), Yellowfin tuna <i>Thunnus albacares</i> (19%) & non-tuna Swordfish <i>Xiphias gladius</i> (24%), Others species include <i>Scomberomorus commerson</i> , <i>Coryphaena hippurus</i> and <i>Acanthocybium solandri</i> .
Main Secondary species	<i>Acanthocybium solandri</i> (11.1%); <i>Coryphaena hippurus</i> (8.9%); <i>Scomberomorus commerson</i> (9.2%)

Bycatch species	<p>Families/groups: Sharks (Carcharhinidae and Sphyrinidae) Blacktip shark (<i>Carcharhinus melanopterus</i>) and Blue shark (<i>Prionace glauca</i>); <i>Carcharhinus melanopterus</i> and rays (Dasyatidae and Myliobatidae) mainly <i>Taeniura lymma</i>; <i>Taeniura lymma</i></p> <p>Main bycatch species: Shark <i>Carcharhinus longimanus</i> (73% of the discards), Snake mackerel <i>Gempylus serpens</i> (17%), Puffer fishes (3%) and other mixed species (<i>Galeocerdo cuvier</i>, Molas, <i>Alepisaurus ferox</i>, ray fish) < 2%;</p> <p>-valuable source of cheap meat when they are dried and the sharks are also retained because of their fins</p>
Fishing gears	<p>Main gear: Drift gills nets, artisanal long lines, trolling line, Pole & line</p> <p>Other gears: hook and line, handlines, gillnets, monofilament nets</p> <p>-Trolling line (45.9%) entire coast, with 72.7% in Kiwayu, followed by Amu (32.5%). Vanga was dominated by ringnet (56.0%) & lowest in Mbuyuni (1.9%). Longline and handline were mostly used in Amu and Vanga (at 59.6% and 42.3%, respectively) than the other sites.</p> <p>-Gillnet was mostly used in Kiwayu (20.2%)</p> <p>-Outrigger-trolling line was the mostly use vessels-gear combination in Kiwayu (70.9%) compared to Amu (15.4%).</p> <p>-Motorboat and trolling line were mostly used in Mbuyuni (68.08%) compared to Amu (11.7%).</p> <p>-Dhow and ringnet mostly used vessel gear combination in Vanga (55.35%) and less in Mbuyuni (1.94%)</p>
Fishing gear / Fishery interactions	Gear interactions: long lines vs gillnets vs ringnets vs handline vs others
Fishing vessels	-Mainly Fiberglass reinforced plastic (FRP) boat with engine, Dhowd (Mashua) with inbuilt engines also common; most grounds for the snapper fishery are off the range for the small inshore fishing vessels; Outriggers (Ngalawa) common with migrants
Fishing grounds	-Kenya's EEZ lies within the richest tuna belt of the South West Indian Ocean (SWIO); Open seas (Pelagic waters) with the main grounds in Kiwayu and the Lamu archipelago being Itamwamba dau, Mwamba mkuu & Chongo cha chano by fishers from Amu, Kiwayu & Kizingitini fishing villages.
Fishing seasons	-all year round; NEM and SEM, though reduced frequency during SEM (but catches are good during these periods). -highly seasonal activity where artisanal vessels target migratory tuna during July-November.
Fishing operations	Drift gillnets are set in mid pelagic water and left to drift freely with the current while hooked to the fishing vessels, once adequate catch is captured, they are hauled with the catch before resetting again.
Geographic Extend of fishery	Kwale, Kilifi & Lamu coastal waters
Fishing Effort & level of Exploitation	-pole-and-line fishery, skipjack with some yellowfin and bigeye tunas make up 87% and bycatch 4.3% and bait 8.3% of landings. As

<p>Catch per unit effort (CPUE)</p>	<p>CPUE: Frame surveys 2014 estimates ≈ 9.45kg/fisher/day, recent survey (this survey) 10.40kg/fisher/day; fish stocks still relatively unfished, need for empowerment to exploit the offshore small scale tuna fisheries.</p> <p>-Annual averages: 12.04 ± 7.15 kg/fisher/day in Mbuyuni; Amu 2.75 ± 1.59 kg/fisher/day; Trolling line had highest CPUE, Mbuyuni 13.50 ± 6.52 kg/fisher/day; Amu gillnets CPUE 2.75 ± 1.59 kg/fisher/day. In Vanga, ringnet 10.71 ± 9.20 kg/fisher/day; Catch rates: Longline Vanga 28.9 ± 4.0 kg/fisher/day, gillnet from Amu 2.75 ± 1.6 kg/fisher/day;</p> <p>Landings: contributes $\approx 9,000$Mt/yr worthy <KES 1.0 billion; but potential estimated at 1.5-2x the reported landings; industrial fishing fleets 156Mt and 771Mt; estimated offshore potential is $\approx 50,000$ to 150,000 Mt/yr; FAO (1981) estimated MSY at 150,000Mt/yr.</p> <p>Fisher Issues: impact on retained and discarded by-catch species, Impact on the ecosystem as a whole particularly damage to coral reefs from gillnet and purse seine; baitfish, however, are typically species low in the food chain with rapid turnover but may be target species for other SSFs; Baiting rates are 1kg of bait caught for 8.6 kg of tunas (Anderson 2009); tuna-to-bait ratio range from 7:1 to 11:1 (Gillett, R. (2012)</p> <p>Issues on ETPs: incidental catch of sharks, rays and seabirds in longlines poses one of the main threats to these species at the global scale, these species are esp. vulnerable because of some biological reasons, such as low fecundity and productivity, slow growth, late age at maturity, large size at birth, high natural survivorship and a long life; Most are IUCN listed hence mitigation is a priority.</p> <p>Issues on ecosystem/habitats: The nature of the fishing operations, mainly within the pelagic waters have little implications for ecosystems and habitats.</p> <p>-56% of the catch is made by longlining. Several mitigation measures are in place (sharks, turtles, sea birds). Monitoring is deficient.</p> <p>-21% of the catch is made by purse seining on floating objects (including FADs).</p> <p>-Several bycatch mitigation measures are in place (turtles, sharks).</p> <p>-7% of the catch is made with purse seining on free schools, with little impact on non-target species.</p> <p>-16% of the catch is made by other gears such as gillnet. There is poor reporting by these fisheries which are thought to have substantial amounts</p>
<p>Biological data</p>	<p>-BET average size 40-180cm (BW 1.4-130kg); L_{max} 230cm (210kg); L_{mat} 105-135cm (25-57kg); SKJ average 40-80 cm, with L_{max} 108cm (33kg) & L_{mat} 43cm (1.6kg); YFT average size 40-170 cm (1.2-100kg), L_{max} 205cm (194kg), L_{mat} 85-108 cm (12-26kg)</p> <p>- BET ratio of F_{CURR}/F_{MSY} is estimated to be 0.42 (range: 0.21 to 0.80), indicating that overfishing is not occurring; ratio of spawning biomass B_{CURR}/B_{MSY} is 1.44 (range: 0.87 to 2.2), indicating that the stock is not in an overfished state</p> <p>- size-at-massive-maturity (L_{50}) for female <i>E. affinis</i> was at 52 cm (55.5 ± 9.8 cm, female) & 92.6 cm (69.9 ± 16.6 cm, male)</p>
<p>Stock Assessment</p>	<p>-Few studies have estimated the small-scale tuna stocks; however, data on the large scale / industrial tuna fisheries is fairly elaborate; no stock assessments on Big-eye Tuna; Few comprehensive assessments for near shore stocks;</p>

	<p>Stock Status: 428,719 Mt/yr for Skipjack tuna, 71,489 My/yr for Bigeye tuna and 299,074 Mt/yr for Yellowfin tuna (IOTC data); MSY for the skipjack tuna stock is 564,000 Mt/yr compared with 102,900 -114,000 Mt/yr for Bigeye and 357,000 Mt/yr for Yellowfin tuna. The general outlook is that the stocks of all the three tuna species are stable.</p> <p>-concerns over the level of recruitment of Yellowfin in the last 15 years and the capacity of the stock to support higher yields.</p> <p>-stock status of the coastal Neritic tuna resources is unknown due to lack of adequate catch and effort data from the artisanal fishery to support stock assessments.</p>
Management / Legislation / Governance	<p>-The National Tuna Management and Development strategy (2013-2018,) Status-ongoing</p> <p>-Provides blue print for the sustainable development of the Kenya's tuna fisheries resources occurring in the Exclusive Economic Zone (EEZ)</p> <p>- Harvest control rule: Not defined yet</p>
Data & MCS	<p>-need for increased data collection and MCS, research for definition of sound management options, establish changes in the stock status</p> <p>- quality fishery dependent data of tuna fisheries is inadequate due to limited staff, lack of species categorization of catch by local vessels, and lack of observers onboard the DWF vessels; independent means to verify the accuracy of the data provided is inadequate</p>

4.2.1.1.1 Family Scombridae

Tunas are pelagic marine fish, spending their entire lives relatively near the surface of tropical, subtropical and temperate oceans and seas. Tuna species attaining only small sizes and juveniles of those attaining large sizes are encountered in epipelagic waters whereas large tunas tend to be mesopelagic, inhabiting deeper and cooler waters. Some tunas are found in both offshore and coastal waters and others entirely, or almost entirely, in coastal waters.

1. Kawakawa (KAW) *Euthynnus affinis*

The Kawakawa occurs in open waters but always remains close to the shoreline with the young occurring bays and creeks. The species forms multi-species schools by size with other scombrid species and is a highly opportunistic predator feeding indiscriminately on small fishes, especially on clupeoids, atherinids, squids, crustaceans and zooplankton. In turn; it is preyed upon by marlins and sharks. Its a common species in most of the multispecies fisheries along the Kenya coast employing trolling, long lines and gill nets. Although sexually mature fish may be encountered throughout the year, there are seasonal spawning peaks from the mid NEM season to start of SEM (i.e. January to July) off entire East Africa coast.

2. Bigeye tuna (BET) *Thunnus obesus*

The BET is a large, fast-swimming tuna and it is an important target for the commercial fisheries. The species occur in areas where warmer water temperatures (13°-29°C) mostly in depths <500m. Juveniles and small adults school at the surface in mono-

species groups or mixed with other tunas and may be associated with floating objects. The eggs and larvae are pelagic with adults staying in deeper waters. It feeds on a wide variety of fishes, cephalopods and crustaceans during the day and at night. It is a multiple spawner and can spawn every 1-2 days over several months. Spawning occurs all year round with a peak between January and March. They exhibit feeding and spawning migrations between temperate waters and tropical waters.

3. Yellowfin tuna (YFT) *hunnus albacares*

The yellowfin tuna is a schooling fish, aggregating with fish of the same size other than schools with other yellowfin tunas. They can often be seen swimming near the surface with other tunas. It is an opportunistic predator, feeding on a wide variety of fish, squid, cuttlefish, octopus, shrimp, lobster and oceanic crabs. They are highly migratory likely correspond with their spawning behavior and with their food needs. The species reproduces via broadcast spawning. Unlike most fish yellowfin tunas have a counter-current exchanger that allows them to maintain a body temperature that is higher than the surrounding water, giving them advantage especially in cold water waters.

4. Other Tunas

The Skipjack tuna (SKJ), *Katsuwonis pelamis* are a highly migratory fish roaming the world's oceans in tropical and subtropical zones. They live mostly in the open ocean and can be found in large schools swimming long distances to feed and reproduce. They are fast growers, reaching about ≈ 80 cm and weighing 8- 10 kg. They have a lifespan of $\approx 8-12$ years, reaching reproductive maturity at ≈ 40 cm TL. The species is very productive, spawning throughout the year with females able to spawn almost daily, releasing millions of eggs. They are at the top of the food chain and feed on other fish; squid and crustaceans.

The Frigate tuna, *Auxis thazard* is an epipelagic occurring in warm waters. It is highly migratory in both coastal and oceanic waters, and highly gregarious, schooling with other Scombrids. The largest size in Indian Ocean waters is ≈ 58 cm. The maturity size is 29-35 cm FL depending on location. Spawning of the frigate tuna occurs from April to September. Fecundity ranges 200,000 to 1.6 million eggs per spawning depending on size. The species feeds on small fish, squids and planktonic crustaceans (decapods and stomatopods). Because of their high abundance, they are considered an important prey for a range of species, including the larger tunas.

4.2.1.1.2 Elasmobranchs (Sharks and Rays)

Sharks are often top-predators and high trophic level feeders. Certain species are benthic feeding on small bottom fish and crustaceans, some species prefer continental and insular shelves to forage on reefs, and some species migrate long distances throughout the open ocean. Sharks are either egg-laying, give birth to young ones. The duration of a single reproductive cycle takes ≈ 2 years.

On the other hand, rays occur near reefs and in coastal lagoons. Many members migrate exhibit spawning, migrations between temperate and tropical waters. The reproductive system involves internal fertilization, bearing young on a yearly cycle, although pregnancy usually lasts only several months. Rays may solitary, in pairs, or in schools of a hundred or more in pelagic waters, near reefs or over a continental shelf, often near the surface foraging for food.

4.2.1.2 Management of the Small-Scale Tuna Fisheries

4.2.1.2.1 Fishery Resource Management Bodies

Like the rest of the coastal and marine fisheries in Kenya, the main fisheries management body is the State Department of Fisheries, Aquaculture & the Blue Economy. The Kenya Marine Fisheries Research Institute (KMFRI) is the primary body mandated with fisheries and aquatic resource surveys. At the county levels, the management is under the mandate of the County Directorates of Fisheries. Beaches and landings sites are managed by communities who appoint managers and a secretariat and oversee the collection and recording of catch data under the BMU structure. The objectives BMUs include effective fisheries management, compliance with regulations, and supporting structures for the sustainable development of the fishery sector. The SDFA&BE oversees the running of the BMUs by approving management plans as a means of broadening stakeholder participation in fisheries management. Among the stipulated responsibilities of BMUs are resolving user conflicts, field patrols, ensuring a healthy fishing and landing environment, data collection, enumerating by-laws, ensuring safety in the ocean, control of illegal gears and fishing, protection of breeding sites and maintenance of high fish quality standards. However, because of the extensive coastline and poor policing on the ground, fish landed and sold on are often not recorded, and the data leakage may account for over 40% of the unrecorded landings.

Other bodies involved include the Fish Exporters Processing Zones Authority, the Kenya Fish Processes Exporters Association (AFPEK) and the Fish Inspection and Quality Assurance (FIQA) under the KeFS which is mandated the fish quality control. Further, NGOs such as WWF, TNC, WCS, CORDIO have established programmes, particularly in Marine Protected Areas (MPAs) that monitor and sample fish catches. The Kenya Wildlife Services (KWS) is responsible for management of Marine Parks.

4.2.1.2.2 Fisheries Instruments and Legislations for the Tuna Fisheries

The Fisheries Management and Development Act 2016 is main legislation guiding fisheries management of the Tuna fisheries. Additionally, the tuna fisheries fall under the IOTC legislations, the UNFSA 1995, the IPOA Fish Stocks instruments among others. Other important legislations for this fishery include the Kenya National Oceans and Fisheries Policy (2008), Wildlife Management and Conservation Act 201, Kenya Maritime Authority Act (on vessel safety), the County Governments Act 2012, BMU Regulation 2007, the Strategy for the management of the small and medium pelagic

fishery (2013), United Nations Convention on the Law of the Sea (UNCLOS, 1982), the Convention on Migratory Species (CMS), Convention on Biological Diversity (CBD), The FAO Code of Conduct for Responsible Fisheries (FAO- CCRF, 1995), Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) among others

4.2.1.2.3 Fish inspection and quality assurance

Fish inspection and quality assurance (FIQA) is the mandate of the Competent Authority (CA) created under “the fisheries (safety of fish, fishery products and fish feed) regulations, the CA falls under the Fisheries department and it is responsible for overseeing the implementation of regulations governing proper monitoring of fish from harvest, sorting, handling, transportation, processing, and storage.

4.2.1.2.4 Key Stakeholders

Fishers are indisputably among the definitive stakeholders since they are directly affected by laws and rules pertaining to fisheries management since they are involved directly in the harvesting of the fishes. Dealers/buyers support fishers with logistics and buy their catches as middlemen, agents or as exporters. Fish processing plants, they buy fish from various chains; directly from fishers or from dealers, then fish bought is then processed and exported or sold to the local markets. The local consumers, they are mainly local folks, hotels and restaurants whom buy fish directly from fishers, dealers or processing plants. The Beach Management Units (BMU's) is Community co-management structures that allow for active participation in the management of fisheries, monitoring of catches and surveillance and control of fishing activities. Government agencies such as Fisheries Department, Coastal Development Authority, Kenya Marine and Fisheries Research Institute, Kenya Wildlife Services assist in monitoring, controlling and regulating the fisheries, the Indian Ocean Tuna Commission (IOTC) whose aim is to promote cooperation among the Contracting Parties (Members) and Cooperating Non-Contracting Parties of the IOTC with a view to ensuring, through appropriate management, the conservation and optimum utilization of stocks covered by the organization's establishing Agreement and encouraging sustainable development of fisheries based on such stocks.

4.2.2 SMALL SCALE TUNA FISHERY PRE-ASSESSMENT RESULTS

4.2.2.1 Principle 1: Sustainability of the Exploited Fishery Stocks

4.2.2.1.1 *Thunnus albacores* Stocks

The average annual catches for *T. albacores* averaged $\approx 399,830$ Mt during 2013-2017 with 2017 recording higher landings at 409,567 Mt. The current fishing effort (F_{CURR}) is 0.18 against an optimal effort (F_{MSY}) of 0.15, with a current yield of $\approx 409,000$ Mt against an MSY of 403,000 Mt/yr. Evidently, the current fishing effort is likely to impact the sustainability of the fishery stocks if sustained at the F_{CURR} of 0.18. SSB_{CURR}/SSB_{MSY}

ratio is 0.83 while SSB_{CURR}/SSB_0 of 0.30. Therefore, the current biomass is just slightly above the critical limit of 20% of the SSB_0 further indicating that continued pressure would subject the *T. albacore* stocks to overfishing. Despite the low stock levels, there are no fishery-specific harvest strategies in place, and stock rebuilding strategies are also clearly lacking.

HCRs for exploitation of the tunas are generally understood from legislations such the Convention on Indian Ocean Tuna (IOTC) and other international instruments e.g. UN Fish Stocks Agreement (UNFSA, 1995), FAO-CCRF (1995), International Plans of Action (IPOA) for IUU fishing and fishing capacity among others. If well implemented, these HCRs can maintain exploitation rates at levels that are not likely to impair recruitment. Further, relevant information on fleet composition is available to support management since the IOTC is dependent on data from member states, including Kenya. Although active monitoring and research on tuna removals is limited, some regional stock assessments have been conducted and sources of uncertainty determined and reviewed under the IOTC conventions.

4.2.2.1.2 *Euthynnus affinis* & *Thunnus obesus* Stocks

The average catch landings for *Euthynnus affinis* were estimated at 155,764Mt during 2010-2014 with 2014 recording the highest landings at 162,687Mt, accounting for 28.6 % of the tuna and tuna-like species landings. The MSY is estimated 152,000 Mt at a current fishing effort (F_{CURR}) almost fluctuating at the F_{MSY} effort ($F_{CURR}/F_{MSY}=0.98$). The SSB_{CURR}/SSB_{MSY} is 1.15 against a SSB_{CURR}/SSB_0 of 0.58, suggesting that fishery is being exploited at a fairly sustainable level, around the MSY, and SSB_{CURR} still above 50% of the virgin biomass (SSB_0).

The average annual landings of *T. obesus* are estimated at 71.489 Mt accounting for 26% of tuna and tuna-like species. The F_{CURR}/F_{MSY} is estimated at 0.42 (range: 0.21 to 0.80) with SSB_{CURR}/SSB_{MSY} at 1.44 (range: 0.87 to 2.2). Therefore, for both species the current stocks are way above the the MSY levels while the fishing effort is only 42% of the effort with low likelihood of overfishing. There is currently no precautionary harvest strategy nor HCRs in place for the management of the removals. However, HCRs are well defined in the IOTC conventions and there is a dire need for the development of domestication of the global and regional fishery legislation in definition of a national harvest strategy. Stock assessments data is available on the tuna stocks and can be used to set clear harvest control rules. The data and information is adequate for stock assessments and establish stock status relative to reference points. Nonetheless, limited monitoring and research is conducted under the routine fishery surveys and the UOA removals. Information on fleet composition is also available from IOTC reports to support management. However, species-specific stock assessments, and especially for the Bigeye Tuna are inadequate.

Table 7. Small Scale Tuna Summary Conservative scores for Principle 1 PIs

P1 YFT	Outcome	1.1.1	Stock status	<60
		1.1.2	Stock rebuilding	<60
	Management	1.2.1	Harvest strategy	<60
		1.2.2	Harvest control rules & tools	<60
		1.2.3	Information & monitoring	<60
		1.2.4	Assessment of stock status	60-79
P1 BET	Outcome	1.1.1	Stock status	>80
		1.1.2	Stock rebuilding	----
	Management	1.2.1	Harvest strategy	<60
		1.2.2	Harvest control rules & tools	<60
		1.2.3	Information & monitoring	<60
		1.2.4	Assessment of stock status	60-79
P1 Kawa kawa.	Outcome	1.1.1	Stock status	>80
		1.1.2	Stock rebuilding	----
	Management	1.2.1	Harvest strategy	<60
		1.2.2	Harvest control rules & tools	<60
		1.2.3	Information & monitoring	<60
		1.2.4	Assessment of stock status	60-79

4.2.2.2 Principle 2: Maintenance of the Fishery Ecosystems and Habitats

Information and data is inadequate to estimate the stock status of the primary and secondary species as well as to support measures, for management of associated impacts on the primary species, secondary species, habitats and ecosystems. Available data shows that *Acanthocybium solandri* accounts for 11.1%; sword fish 24.0%; *Coryphaena hippurus* 8.9%; *Scomberomorus commerson* 9.2% and sharks and rays 2.0% of the total landings. However, for the minor species; sharks, it is likely that the species are likely undergoing recruitment overfishing based on the biological characteristics and fishing effort information available, that varies by species. Therefore, a Risk-Based Framework (RBF) analysis is recommended for the primary species and the associated habitats in addition to extensive studies to quantify the impacts of the fishery on the ecosystems.

General fisheries management strategies incorporated in the Indian Ocean Tuna Commission conservation and management measures, the Wildlife Conservation and Management Act of 2013, the Fisheries Management and Development Act of 2016 as well as other international legislations e.g. Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) are available for management of the associated primary species, secondary species, the habitats and the general ecosystem. The fishery operates in pelagic waters plus the scale of the fishery in Kenya is very small thus is highly unlikely to cause serious deleterious effects to ecosystem components and key habitats.

Table 8. Small Scale Tuna Seine Summary Conservative scores for Principle 2 PIs

P2	Primary species	2.1.1	Outcome	<60
		2.1.2	Management strategy	<60
		2.1.3	Information/Monitoring	<60
	Secondary species	2.2.1	Outcome	<60
		2.2.2	Management strategy	60-79
		2.2.3	Information/Monitoring	<60
	ETP species	2.3.1	Outcome	<60
		2.3.2	Management strategy	<60
		2.3.3	Information strategy	<60
	Habitats	2.4.1	Outcome	60-79
		2.4.2	Management strategy	----
		2.4.3	Information	60-79
	Ecosystem	2.5.1	Outcome	>80
		2.5.2	Management	60-79
		2.5.3	Information	<60

4.2.2.3 Principle 3: Effective and Responsible Management of the Fishery

A well informed management system exists within an appropriate and effective legal and/or customary framework. However, domestication and testing of the same for effectiveness in specific management of the tunas. The current fishery system; Fisheries Management and Development Act of 2016 incorporates consultation processes and has clear long-term objectives to guide decision-making that are consistent with MSC Principles and Criteria, incorporating the precautionary approach (EAF) to standards similar to international agreements which must therefore be strengthened. A Fishery-specific management system i.e. is the Kenya Tuna Fisheries Development and Management strategy (2013-2018, due for review) is also place for sustainable management of the fishery. The strategy is subject to occasional internal review, as need arises, but there is need for thorough evaluation of all parts of the fishery specific management system. Monitoring Control and Surveillance mechanisms are generally in place, occasionally implemented, with some degree of effectiveness. Nevertheless, weak enforcement calls for incentives, including sanctions, as well as implementation of a systematic program for information provision and evaluation of compliance to set regulations.

Table 9. Small Scale Tuna Seine Summary Conservative scores for Principle 3 PIs

P3	Governance & policy.	3.1.1	Legal &/or customary framework	>80
		3.1.2	Consultation, roles & responsibilities	>80
		3.1.3	Long term objectives	>80
	Fishery specific management system	3.2.1	Fishery specific objectives	60-79
		3.2.2	Decision making processes	60-79
		3.2.3	Compliance & enforcement	60-79
		3.2.4	Monitoring & Management	60-79

4.2.3 SMALL SCALE TUNA FISHERIES BMT TOOL ANALYSIS RESULTS

Pre-assessment results for *T. albacares* show that only four (4) PIs; Ecosystem outcome (PI 2.5.1), Legal and Customary Framework (PI 3.1.1), Consultations Roles and Responsibilities (PI 3.1.2) and Long-term Objectives (PI 3.1.3) scored ≥ 80 . Fourteen (14) PIs scored <60 and nine (9) PIs scored 60-79. The detailed Pre-assessment results for *T. albacares* tuna fisheries based on MSC Sustainability Criteria are shown in the Appendix 3.

The overall BMT score for the *T. albacares* fishery is 0.31, an indication of a fishery with non-conformity to sustainability outcomes and increased uncertainty about its long-term sustainability. The score for Principle 1 is 0.08; P2=0.21 & P3=0.71 indicating very poor performance for the sustainability of the fishery stocks and maintainance of the ecosystems supporting the fisheries. The design of FiPs under the KEMFSED Project should therefore put more emphasis on steering the fisheries stocks to sustainability with focus on assesment of ecosystem impacts. The results of the fishery BMT analysis results are shown in Figure 5 while the projected benchmarking for the fishery over the five (5) year period (2019-2023) is shown in Figure 6. The full MSC's BMT tool baseline results and 5-year projections for *T. albacares* tuna fishery are shown in Appendix 4.

		Unit of Assessment		
Fishery Name:	SMALL-SCALE TUNA FISHERIES	Species	Area	Gear type
FIP provider:	KEMFSED PROJECT	YFT	KWL, KLF, LMU	Drift Nets, Lines
Pre-assessment undertaken by:	DR. BERNERD M. FULANDA			
Action plan undertaken by:				
BMT undertaken by:	DR. FULANDA / KEMFSED TEAM			
Date of BMT:	12th MARCH, 2019			

Actual BMT index summary table
Last update: Year 1

Scoring Level	All PIs	Principle 1 Number of PIs	Principle 2 Number of PIs	Principle 3 Number of PIs
≥80	4	0	1	3
60-79	9	1	4	4
<60	14	5	9	0
BMT Index	0.31	0.08	0.21	0.71

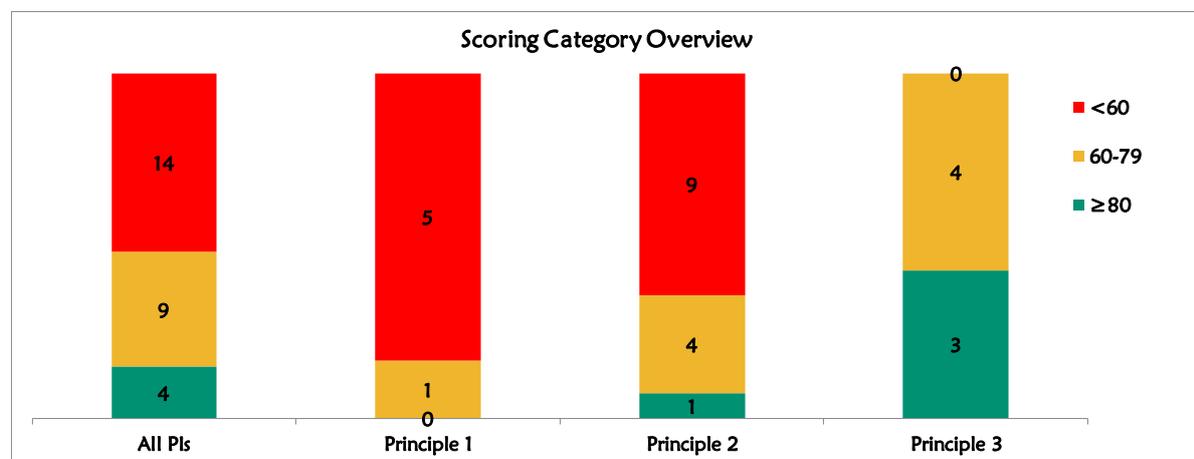


Figure 5. MSC’s BMT Tool Results for Sustainability of the Kenya Marine Yellowfin Tuna - *T. albacares* Fishery

Actual vs. Expected BMT index table

		BMT Index				
		2019	2020	2021	2022	2023
Principle 1	Actual	0.08				
	Expected		0.17	0.33	0.58	0.75
Principle 2	Actual	0.21				
	Expected		0.32	0.54	0.79	0.89
Principle 3	Actual	0.71				
	Expected		0.71	0.79	0.93	1.00
Overall	Actual	0.31				
	Expected		0.39	0.56	0.78	0.89

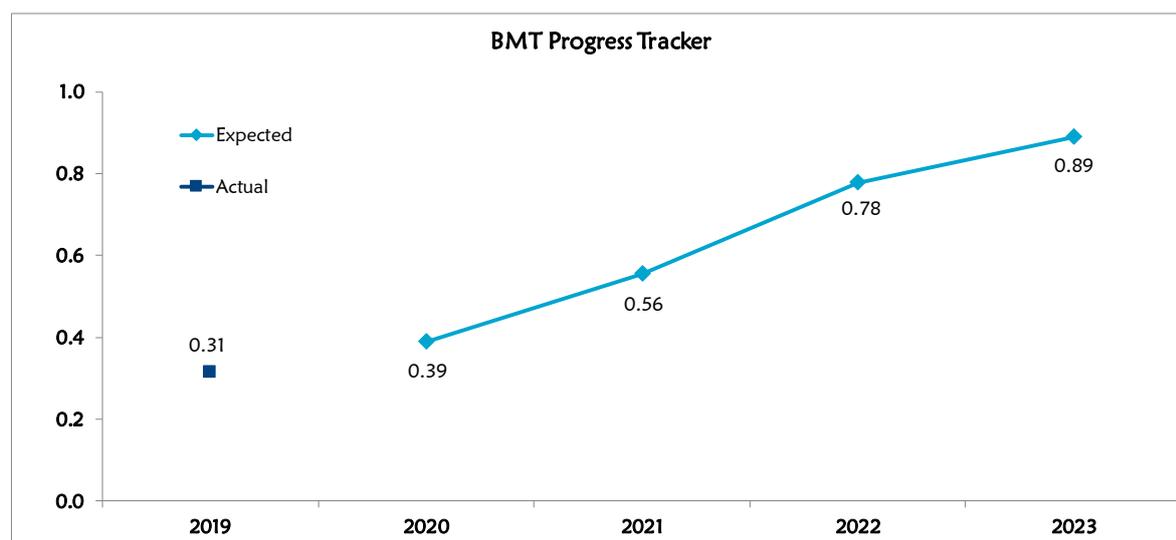


Figure 6. MSC’s BMT Tool Forecast for Improvement of the Kenya Marine Yellowfin Tuna - *T. albacares* Fishery

The Pre-assessment results for *Euthynnus affinis* & *Thunnus obesus* show that only five (5) PIs; Stock status (PI 1.1.1), Ecosystem outcome (PI 2.5.1), Legal and Customary Framework (PI 3.1.1), Consultations Roles and Responsibilities (PI 3.1.2) and Long-term Objectives scored ≥ 80 while 12 PIs scored < 60 and nine (9) PIs scored 60-79. The detailed Pre-assessment results for *Euthynnus affinis* & *Thunnus obesus* tuna fisheries based MSC Sustainability Criteria are shown in the Appendix 5.

The overall BMT score for the *Euthynnus affinis* & *Thunnus obesus* tuna fishery is 0.37, an indication of a fishery on edge but likely to conform to sustainability outcomes and long-term sustainability if concerted efforts for management are enacted, based on the scores of the fishery management and governance PIs. The score for Principle 1 is 0.30; P2=0.21 & P3=0.71. Similar to the other tuna fisheries, the design of FiPs under the KEMFSED Project should put more emphasis on steering the stocks to sustainability and in maintenance of the ecosystems supporting the fisheries. The results of the Fishery BMT analysis results are shown in Figure 7 while the projected benchmarking for the fishery over the five (5) year period (2019-2023) is shown in Figure 8. The full MSC’s BMT tool Baseline results and 5-year projections for *Euthynnus affinis* & *Thunnus obesus* tuna fisheries are shown in Appendix 6

The full MSC’s BMT tool Baseline results and 5-year projections for Small-scale Tuna fisheries are shown in Appendix 6

		Unit of Assessment		
Fishery Name:	SMALL-SCALE TUNA FISHERIES	Species	Area	Gear type
FIP provider:	KEMFSED	KAW, BET	KWL, KLF, LMU	Drift gillnets, Lines
Pre-assessment undertaken by:	DR. BERNERD M. FULANDA			
Action plan undertaken by:				
BMT undertaken by:	DR. FULANDA / KEMFSED TEAM			
Date of BMT:	12TH MARCH 2019			

Actual BMT index summary table
Last update: Year 1

Scoring Level	All PIs	Principle 1 Number of PIs	Principle 2 Number of PIs	Principle 3 Number of PIs
≥80	5	1	1	3
60-79	9	1	4	4
<60	12	3	9	0
BMT Index	0.37	0.30	0.21	0.71

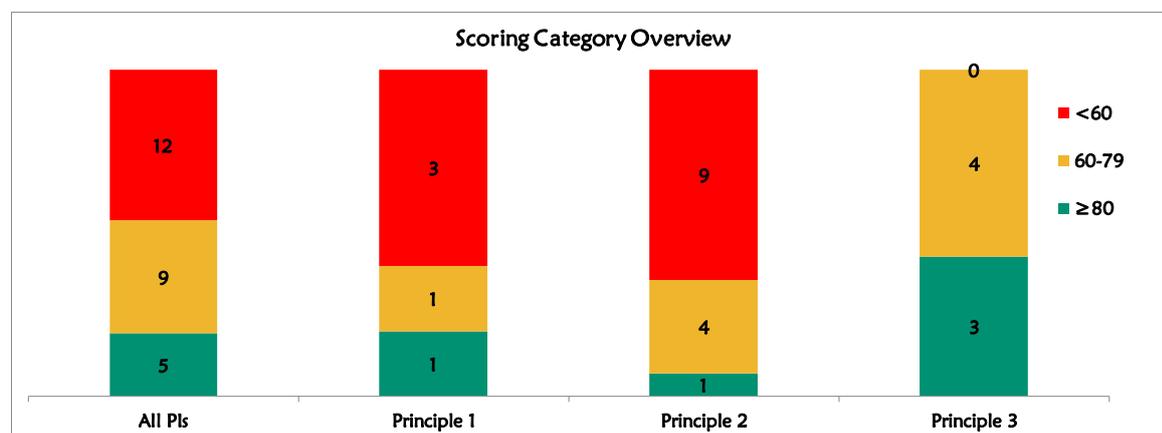


Figure 7. MSC’s BMT Tool Results for Sustainability of the Kenya Marine Kawakawa - *E. affinis* & Bigeye *T. obesus* Tuna Fishery

Actual vs. Expected BMT index table

		BMT Index				
		2019	2020	2021	2022	2023
Principle 1	Actual	0.30				
	Expected		0.30	0.58	0.67	0.92
Principle 2	Actual	0.21				
	Expected		0.32	0.64	0.75	0.93
Principle 3	Actual	0.71				
	Expected		0.71	0.93	0.93	1.00
Overall	Actual	0.37				
	Expected		0.42	0.70	0.78	0.94

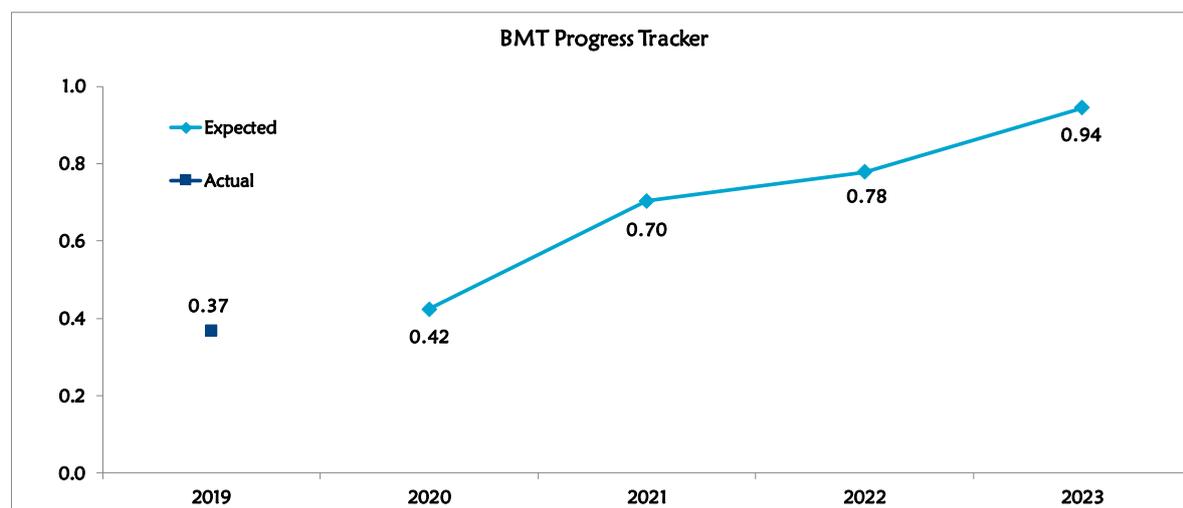


Figure 8. MSC’s BMT Tool Forecast for Improvement of the Kenya Marine Kawakawa -*E. affinis* & Bigeye *T. obesus* Tuna Fishery

4.2.4 CONCLUSIONS AND RECCOMENDATIONS

Generally, the Yellowfin tuna fishery performed dismally in terms of MSC standards with Principle 1 performing the worst (score: 0.08). The fishery is currently considered as overfished and on verge of collapse if urgent measures are not put in place. Analysis of the other two species: Kawakawa, Skipjack and Bluefin tuna stocks are reduced, but not overfished like the YFT. Information of the fishing operations, primary species, secondary species, ETPs and the habitats associated with the fishery is very scanty. However, international instruments and domestic legislations which are being strengthened are available including the Indian Ocean Tuna Commission (IOTC) and the Kenya Tuna Development and Management strategy of 2013-2018.

KEMFSED FiPs should focus on the development of a stock rebuilding framework to enhance the restoration of overfished stocks and ensure the fisheries are sustainable. The approach should incorporate a harvest strategy with regulations on the minimum harvestable sizes. The FiPs should also review the Total Allowable Catch limits based on updated data and information. Strengthening MCS is critical focusing on enhancing compliance to TACs, closed seasons and area- regulations to restore the YFT fisheries into more sustainable state. Extended Risk-Based Framework (RBF) using more recent data is recommended for the primary species; *Katsuwonis pelamis*, *Scomberomorus*

commerson, *Xiphias gladius*, *Acanthocybium scolandry* and *Coryphaena hippurus* to establish the impacts of the UoA on recovering and rebuilding of the primary species. Although there is management strategy being in place (though under IOTC), the YFT is overfished calling for review of the strategy to identify gaps in implementation and enforcement of the regulations set for efficient management of tuna fisheries.

Considerations for enclosed areas and restrictions on landings in non designated areas and enforcement of traceability, data recording, monitoring and stock assessment should be implemented. Baseline stock indicators and alternative biological reference point options should be incorporated into the FiPs to reduce pressure on e.g. YFT juveniles in addition to effective marketing structures for allowable sizes of the species. Consideration for tuna processing plants, especially in remove fisheries such as the Lamu archipelago and Kiwayuu should be considered, remembering the benefits and flourishing of the fisheries that was envisaged e.g. with the defunct Mokowe ice plant and processing factory, in addition to adequate logistics such as fishing ports to secure quality size tuna export; the ongoing Lamu port and the LAPSSSET project is a good precursor for fishing port, and same would apply to the proposed upgrading of sea ports in Shimoni and Msambweni. All these developments would incentivize targeting of mature tuna and essentially reduce pressure on the capture of juveniles.

4.3 SHALLOW WATER PRAWN FISHERIES

4.3.1 FISHERY DESCRIPTION AND CHARACTERIZATION

4.3.1.1 Description of the Fishery

The Malindi-Ungwana bay (MUB) in northern Kenya is presents the richest shrimping grounds along the Kenyan coast. The MUB extends from Malindi in the south to Ras-Shaka in the north and lies between latitudes 2°30′–3°30′S and longitudes 40°00′–41°00′E (Figure 9). The bay is characterized by a shallow continental shelf that ranges from 15 - 60 km offshore. The Sabaki and Tana rivers, the largest Rivers in Kenya, discharge their waters into the bay. The estuarine conditions powered by two rivers make the bay an ideal habitat especially of three species of prawn; the *Penaeus monodon*, *P. indicus* and *P. semisulcatus*.

The bay is home to a semi-industrial prawn fishery alongside the small-scale fisheries segment. In addition to the rich MUB, the small-scale prawn fisheries are also expansive along the entire coast within bays, creeks and the near-shore shallow reefs. The landings from the small scale shrimp fisheries along the coast are estimated at ≈363.5 Mt (2013-2014 data) with Malindi-Ungwana bay contributing >40% of the catch. Currently, there are approximately 400 small scale fishers (mainly on foot) operating on main landing sites of the bay alone. Studies have shown wide disparities in income between small-scale fishers due to huge differences in investment levels especially with regards to fishings gear types and vessels. The existence of both a shallow water and semi

industrial shrimp fishery in the MUB has not been without resource use and fishing grounds partitioning conflicts, with concerns on the environmental impacts of trawls especially with regards to excessive fish by catch and capture of ETPs such as sea turtles and marine mammals. A detailed characterization of the fishery is shown in Table 10.

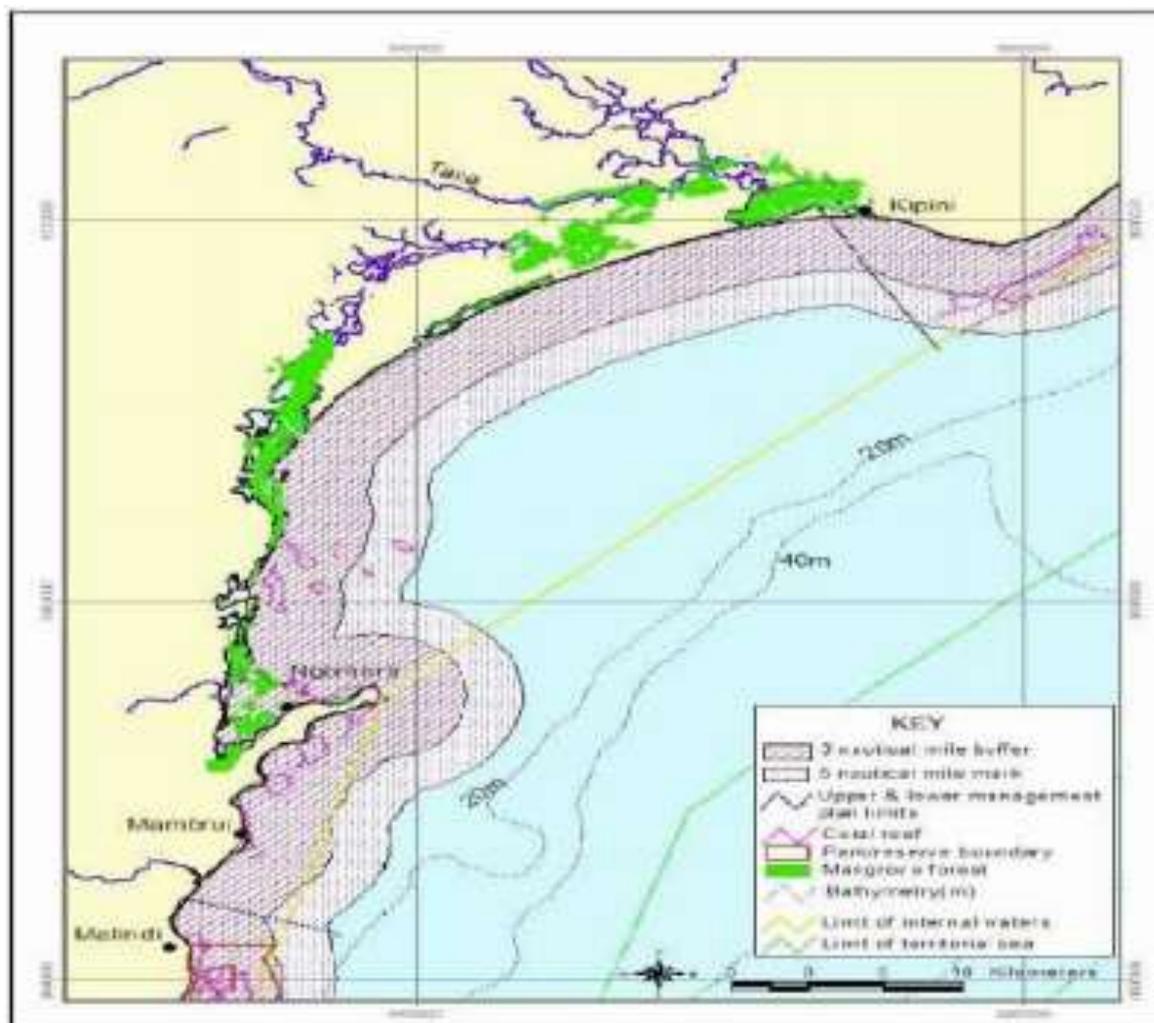


Figure 9. Map of Malindi-Ungwana Bay Showing the Shallow Water Prawn Fishery Grounds and Zonations

Table 10. Characterization of the Small-scale Shallow Water Prawn fisheries

Fishers Scale & types	Mainly inshore coastal waters and in the mangrove creeks; common fishing methods include 300 prawn seines made of monofilament or multifilament material, and 175 cast-nets; There exists a semi-industrial prawn trawl fishery in the Malindi-Ungwana Bay.
Primary target species	Main species: Indian white prawn (<i>Penaeus indicus</i>); giant tiger prawn (<i>Penaeus monodon</i>); Speckled shrimp (<i>Metapenaeus monoceros</i>)
Main Secondary species	Hairy river prawns (<i>Macrobrachium rude</i>), green tiger prawn (<i>Penaeus semisulcatus</i>) and peregrine shrimp (<i>Metapenaeus stebbingi</i>).

Bycatch species	Families: Tilapiines, Mixed marine finfishes, crabs, Mollusca, Crustacea Main species in bycatch: 80% of the total catch constitute mixed by-catch species of which <i>Oreochromis mossambicus</i> constitute 67.6%, mixed marine finfishes including mullets, Rabbit fishes etc. (30.5%), crabs (1.4%), molluscs (0.31) and other crustaceans at 0.17%.
Fishing gears	Main gear: Prawn seine nets Other gears: Cast nets and cylindrical basket traps (locally known as “migono”)
Fishing gear / Fishery interactions	Gear interactions: Artisanal prawn gears interaction with the commercial bottom trawl fisheries and the other artisanal mixed gears (gillnets and beach seines)
Fishing vessels	Mainly foot fishers, with occasional use of dugout canoes & plank dhows and other smaller vessels maneuverable within the creeks and near shore shallow waters.
Fishing grounds	Mainly within mangrove areas and the inshore creeks, shallow muddy bank waters and the nearshore seagrass beds.
Fishing seasons	All year round; NEM and SEM, though reduced frequency in the continental reef during SEM period when most activities are concentrated with the creeks and mangrove areas.
Fishing operations	The prawn seine nets are operated on foot by dragging on the floor within the creeks and shallow waters towards the beach; in slightly deeper waters, it is operated from a canoe while drifting with one end attached.
Geographic Extend of the fishery	-In Malindi-Ungwana Bay, from Malindi in the south to Ras-Shaka in the north (and lies between latitudes 2°30'-3°30' S & longitudes 40°00'-41°00' E -shallow continental shelf that ranges from 15- 60 km offshore; Sabaki and Tana rivers, discharge their waters into the bay. -Main sites: Mijikenda & Kipini open inshore areas, Gongoni and Kurawa in the salt works; spatial expanse of the inshore mangrove areas from Vanga to Kiunga is also prime fishing areas for the small-scale prawn fisheries. Smaller stocks occur within smaller river deltas and estuaries of Lamu (Mkokoni), Kwale (Majoreni) and Mombasa Counties (Mwache and Tudor creeks), and shallow nearshore coastal waters support an artisanal fishery.
Fishing Effort & level of Exploitation	Harvested by around 900 small-scale fishers along the entire Kenyan coastline in the inshore areas (KMFRI 2015). 300 prawn seines made of monofilament or multifilament material, and 175 cast-nets were used. Malindi-Ungwana bay sites of Kilifi and Tana River Counties produce up to 41% of the total prawn production followed by Kwale (39%), and Mombasa with 19% (KMFRI 2015).
Catch per unit effort (CPUE)	- CPUE: ranges 1.0-2.17 kg/fisher/day (CAS data) and 0.17-0.66 kg/fisher/day (KMFRI data); Routine fishery surveys estimate 5.65kg/fisher/day - Catch rates: The average prawn catch rate ranges from 0.17 – 0.66 kg fisher ⁻¹ day ⁻¹ for the prawn seine fishing gear and 0.64 – 0.99 kg fisher ⁻¹ day ⁻¹ for the prawn traps. - Landings: Total artisanal landings and value of prawns between 1990 and 2015 varied between 200 and 750 Mt.

	<ul style="list-style-type: none"> - Fisher Issues: impacts of the shallow water prawn trawlers, saltworks etc., small mesh sizes landing all species entering the gear, a lot of bycatch noted. - Issues on ETPs: none observed - Issues on ecosystem/habitats: damage to benthic habitats by the prawn seines dragging; huge number and weight of bycatch species. 																																																																						
Biological data	<ul style="list-style-type: none"> - Landed prawns average 12.35 mm CL to 54.57 mm CL; <i>Penaeus indicus</i> with $L_{\infty} \approx 7.20$cm CL against size at massive maturity $L_{m50} \approx 3.12$cm CL; <i>Penaeus monodon</i> $L_{\infty} = 11.2$cm CL against size at massive maturity $L_{m50} = 6.98$cm CL; <i>Metapenaeus monoceros</i> $L_{\infty} = 4.34$cm CL against size at massive maturity $L_{m50} = 2.36$ cm CL; <i>Penaeus semisulcatus</i> $L_{\infty} = 5.36$cm, $L_{m50} = 4.40$, $L_m = 1.91$cm and $L_c = 0.71$cm CL 																																																																						
Stock Assessment	<p>Stock parameters</p> <table border="1" data-bbox="411 689 1401 864"> <thead> <tr> <th>Exploitation parameter</th> <th><i>P. indicus</i></th> <th><i>P. monodon</i></th> <th><i>M. monoceros</i></th> <th><i>M. stebbingi</i></th> <th><i>P. semisulcatus</i></th> <th>Average</th> </tr> </thead> <tbody> <tr> <td>Current fishing mortality, (F_{CURR})</td> <td>2.54</td> <td>1.09</td> <td>1.51</td> <td>2.49</td> <td>2.34</td> <td>1.99</td> </tr> <tr> <td>SSB/R ($_{CURRENT}$)</td> <td>0.113</td> <td>0.127</td> <td>0.065</td> <td>0.005</td> <td>0.001</td> <td>0.06</td> </tr> <tr> <td>Yield per Recruit (Y/R) ($_{CURRENT}$)</td> <td>0.263</td> <td>0.231</td> <td>0.182</td> <td>0.383</td> <td>0.232</td> <td>0.25</td> </tr> <tr> <td>Exploitation rate (F/Z) ($_{CURRENT}$)</td> <td>0.76</td> <td>0.59</td> <td>0.59</td> <td>0.61</td> <td>0.66</td> <td>0.64</td> </tr> </tbody> </table> <table border="1" data-bbox="411 891 1401 1088"> <thead> <tr> <th>Exploitation parameter</th> <th><i>P. indicus</i></th> <th><i>P. monodon</i></th> <th><i>M. monoceros</i></th> <th><i>M. stebbingi</i></th> <th><i>P. semisulcatus</i></th> <th>Average</th> </tr> </thead> <tbody> <tr> <td>Fishing mortality at maximum sustainable yield (F_{MSY})</td> <td>0.90</td> <td>1.04</td> <td>0.75</td> <td>1.55</td> <td>1.00</td> <td>1.04</td> </tr> <tr> <td>SSBR/R ($_{MSY}$)</td> <td>0.139</td> <td>0.135</td> <td>0.205</td> <td>0.032</td> <td>0.047</td> <td>0.11</td> </tr> <tr> <td>Yield per Recruit (Y/R) ($_{MSY}$)</td> <td>0.264</td> <td>0.231</td> <td>0.214</td> <td>0.403</td> <td>0.283</td> <td>0.27</td> </tr> <tr> <td>Exploitation rate (F/Z)</td> <td>0.5</td> <td>0.5</td> <td>0.5</td> <td>0.5</td> <td>0.5</td> <td>0.5</td> </tr> </tbody> </table> <ul style="list-style-type: none"> - Fishing Mortality $F_{CURR} \approx 1.99$ above F_{MSY} by 89.5% = heavy overfishing in the fishery. - Spawning stock biomass per recruitment (SSB/R) ≈ 0.06, below SSB/R_{MSY} (0.2); shows spawning stock is currently overfished. - Current exploitation rate (F/Z) of 0.59-0.76 for the prawn species is above 0.5 indicating that the fishery is overfished. - Bycatch with high proportions of finfish and non-fish bycatch; $\approx 20\%$ of the fishery catches are prawns while 80% constituted of mixed by-catch species. <p>(Sources: KMFRI KCDP Stock Assessment data)</p>	Exploitation parameter	<i>P. indicus</i>	<i>P. monodon</i>	<i>M. monoceros</i>	<i>M. stebbingi</i>	<i>P. semisulcatus</i>	Average	Current fishing mortality, (F_{CURR})	2.54	1.09	1.51	2.49	2.34	1.99	SSB/R ($_{CURRENT}$)	0.113	0.127	0.065	0.005	0.001	0.06	Yield per Recruit (Y/R) ($_{CURRENT}$)	0.263	0.231	0.182	0.383	0.232	0.25	Exploitation rate (F/Z) ($_{CURRENT}$)	0.76	0.59	0.59	0.61	0.66	0.64	Exploitation parameter	<i>P. indicus</i>	<i>P. monodon</i>	<i>M. monoceros</i>	<i>M. stebbingi</i>	<i>P. semisulcatus</i>	Average	Fishing mortality at maximum sustainable yield (F_{MSY})	0.90	1.04	0.75	1.55	1.00	1.04	SSBR/R ($_{MSY}$)	0.139	0.135	0.205	0.032	0.047	0.11	Yield per Recruit (Y/R) ($_{MSY}$)	0.264	0.231	0.214	0.403	0.283	0.27	Exploitation rate (F/Z)	0.5	0.5	0.5	0.5	0.5	0.5
Exploitation parameter	<i>P. indicus</i>	<i>P. monodon</i>	<i>M. monoceros</i>	<i>M. stebbingi</i>	<i>P. semisulcatus</i>	Average																																																																	
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Management / Legislation / Governance	<ul style="list-style-type: none"> - Prawn Fishery Management Plan (PFMP) of 2010 has small scale prawn fisheries aspects partially incorporated; - Fisheries management and Development Act 2016 envisages general fishery management principles, measures, objectives and approach; - Fishing mortality on the prawns should be reduced from the current 1.99 to 1.05, a decrease of about 89.5% either by implementing mesh size regulations or reducing fishing pressure on the nearshore fishery. - Malindi-Ungwana co-management plan is in place. - Undefined harvest strategies 																																																																						
Data & MCS	<ul style="list-style-type: none"> - Malindi-Ungwana bay grounds are among the top fishing areas in prawn production $\approx 41\%$ of the total prawn production (Survey data Jan/Feb 2019, this consultancy); no evidence of local fishers conducting industrial/commercial fisheries. 																																																																						

4.3.1.1.1 Family Penaeidae

1. Indian Prawn *Penaeus indicus*

The Indian prawn is one of the major commercial prawn species in the small-scale prawn fisheries along the Kenya coast, extending to other waters of the Indian-west Pacific. Adult shrimp reach ≈ 22 cm and inhabit the benthic habits of shallow waters, extending to the outer shelf in waters < 90 m deep. Early development stages take place in open waters with planktonic larvae drifting into estuaries to mature, and return to the sea as sub adults. The species don't burrow preferring sandy bottoms, and are active during both day and night. *Penaeus indicus* has an offshore planktonic larval phase; an estuarine, benthic post larval, juvenile phase and an inshore ocean adult and spawning phase (Dall et al., 1990, FAO, 2008).

2. Giant Tiger Prawn *Penaeus Monodon*

The Giant tiger prawn is perhaps the most exploited species among the penaeid shrimps of the coastal waters. It matures and breeds only in tropical marine habitats, spending their larval, juvenile, adolescent and sub-adult stages in coastal estuaries, lagoons or mangrove areas. *Penaeus Monodon* has an offshore planktonic larval phase of about 14 to 20 days (Kenway and Hall, 2002); an estuarine, benthic post larval and juvenile phase of over 6 months (33 g); a coastal sub adult phase of 5 to 6 months (60 g); and an inshore and offshore ocean adult and spawning phase (60 to 261 g) (Dall et al., 1990, Kenway and Hall, 2002). This life history cycle makes the species more vulnerable to overfishing due especially where exploitation by the small-scale fishing gears within mangroves is intense. The species show marked nocturnal activity, burrowing into bottom substratum during the day and emerging at night to search for food as benthic feeders.

3. Green Tiger *Penaeus semisulcatus*

The Green tiger prawn inhabits mostly deeper, less turbid waters and muddy substrates associated with sea grass meadows with adults preferring waters of $\approx 3-20$ m in large bays and offshore shelf areas. It's a naturally burrowing species during daytime but feed during the night, and therefore most of the fishing for this species takes place in the shallow waters during very early morning or late evening, using mostly prawn seine nets. *Penaeus semisulcatus* has a Type 3 life cycle. It spawns offshore and the larvae develop there while the juveniles develop in sea grass or algal beds inshore and in the lower reaches of estuaries. Post-larval and young dull are often associated with submerged macrophytes especially in estuarine waters.

4. Speckled Shrimp *Metapenaeus Monoceros*

The speckled shrimp *M. monoceros* inhabit diverse habitats, from areas with submerged macrophytes to deeper reaches of mangrove swamps in low salinity environment. The species can be found in deeper reef waters upto 170m but commonly occur in the shallower 10-30 m. They prefer sandy or sandy mud bottoms in both brackish or marine environments. The *Metapenaeus monoceros* attain a maximum carapace length of 5.0

cm and Prefers bottom sandy mud they also occur on sea grasses, mudflats, sand flats and mangrove channels. Frequently burrows and feeds on crustaceans, polychaetes, mollusks, fishes, algae and detritus. their mating behavior is through precopulatory courtship ritual is common through olfactory and tactile cues usually indirect sperm transfer the females spawn once every two (2) months with peaks from February to June and August.

External factors affecting the stock

The shallow water fisheries along the Kenya coast are faced with numerous challenges including resource-use conflicts especially between artisanal and commercial fisheries and stakeholders concerns on its environmental impacts which includes excessive fish, by catch and capture of sea turtles and mammals in the Malindi-Ungwana Bay. The bay is also impacted by sediments from River Tana and Sabaki that affect productivity and environmental integrity.

Vessels used in the small scale shrimp fisheries are mainly traditional crafts which account for more than 40% of the vessels in the fishery. On the other hand, the commercial bottom trawl fishery dates back to the early 1970s and is Kenya's only marine commercial shrimp fishery. The fishing fleet is mainly comprised of semi-industrial trawlers that range in size from 25 to 40 m long with >450 Hp engines. The trawlers employ double-rigged, stern or outrigger trawling as the predominant method of fishing. A large proportion of by-catch in the small-scale fisheries includes juveniles which are often discarded. By-catch of sea turtles has also generated considerable publicity and controversy, causing large shrimp fisheries to take precautionary actions including mandatory installation of turtle excluding device.

Despite targeting shrimps, trawl nets have been identified as sources of mortality of cetacean and finfish species such as *Otolithes ruber*, *Galeichthys feliceps*, *Pellona ditchella*, *Leiognathus equuluus* and *Lobotes surinamensis*.

5. Endangered Threatened and Protected species

Sea turtles

Five species of sea turtles have been documented within Kenyan marine waters (Frazier 1975): the green turtle (*Chelonia mydas*), hawksbill turtle (*Eretmochelys imbricata*), loggerhead turtle (*Caretta caretta*), olive ridley turtle (*Lepidochelys olivacea*) and the leatherback turtle (*Dermochelys coriacea*). Of these, the green, hawksbill and olive ridley turtles are known to nest in Kenya. They inhabit shallow sea grass beds, reefs and sandy beaches. All the species are classified as Endangered due to poaching and over-exploitation. They also face with habitat destruction and accidental capture in fishing gear. Sea turtles spend their juvenile years in near shore habitats and migrate to a new feeding ground as they reach adulthood, later moving to nesting beaches and rookeries to breed, often in areas where they were born.

Sharks

The shallow water prawn fishery bycatch comprises of juvenile hammerhead sharks *Sphyrna lewini*, blacktip reef shark *Carcharhinus melanopterus* and grey reef shark *Carcharhinus amblyrhynchos*. The *C. melanopterus* is a small shark that inhabits shallow waters close inshore on coral reefs and in reef-off drops close offshore. They are also found in mangrove areas migrating with the tides. Sharks have adapted to living in a wide range of aquatic habitats from shallow, coastal regions, to deep waters on the ocean floor and in the deep ocean. Most sharks are active during the evening and night when they hunt. They tend to mature slowly and reach a reproductive age from 12 to 15 years, giving birth to one or two sharks in their lifetime. This makes it difficult to recover after a decline in the population especially when juvenile sharks are caught as bycatch. *Sphyrna lewini* mostly inhabit continental shelves and coastlines, but are occasionally found in the epipelagic waters. During the day they are more often found close to shore and at night they hunt further offshore. Their gestation period is for twelve months and produces large litters. *Carcharhinus amblyrhynchos* are found in shallow waters on and near coral reefs and occasionally brackish waters. Juveniles are typically found in extremely shallow waters inside lagoons often swimming along the shoreline. They are also found in mangrove areas, moving in and out with the tide and even in fresh water near the sea.

Rays

Some of the species in Kenya's marine fisheries include *Johnius amblycephalus* inhabiting the shallow coastal waters and estuaries. They feed on small fishes and invertebrates; *Rhinoptera javanica* which found in bays and near coral reefs, over sand and mud bottoms moving in large schools with up to 500 individuals. They are ovoviviparous.

4.3.1.2 Management of the Shallow Water Shrimp Fishery

4.3.1.2.1 Management bodies

Fishery resources in Kenya are managed by the Department of Fisheries through the Fisheries Management and Development Act of 2016. Fisheries research is the mandate of Kenya Marine Fisheries Research Institute. At the landing sites, resource management is under the mandate of Beach Management Units (BMUs) as guided by the co-management structures in BMU (2007) regulations to ensure sustainability through recognition of resource-user rights. Stakeholder groups are also in existence including trawl operators, sport fishers, input suppliers and dealers are generally involved in the management of the small-scale prawn fisheries, and especially in the Malindi-Ungwana Bay.

4.3.1.2.2 Fisheries regulations

In addition to the general legislations, there is a Prawn Fishery Management Plan (PFMP, 2010) incorporating stakeholders' participation and co-management

approaches, with structured consultations between the government implementing institutions, resource-users and other stakeholders. The Plan has several management measures including zoning of the prawn fishing grounds (No Trawl Zone, limit on number of licensed vessels (4 vessels) of max. 300 Hp between 3-5nM and five (5) vessels of >300GRHP beyond five nautical miles, limit on annual TACs, enforcement of closed season (Nov-March), mandatory use of TEDs, mesh sizes regulations, area closures, restrictions on trawl times, requirement for proposal for full use of by-catch etc.

4.3.1.2.3 Key Stakeholders

All key stakeholders, ranging from the trawl venture companies, the small scale fishers, dealers/traders, input suppliers and market holders e.g. hotels, non-fishing households etc. and the National and County governments are all involved in the management of the fishery through the co-management approach. The direct beneficiaries are fishers and dealers who derive their income from production and/or marketing prawn including the trawler companies, artisanal fishers and fish traders (brokers, specialized transporters and dealers). The indirect beneficiaries are stakeholders who depend in a relatively small way or through non-direct means, on shrimp fisheries such as hotels and households, who benefit through consumption of shrimp and the government agencies through taxes on harvested shrimp.

Stakeholder consultations suggest that the trawl bans have caused significant economic losses in terms of foreign exchange, employment, licence fees and food security. The situation is augmented by the seasonal nature of the small-scale fisheries, with most BMUs and delayers dependent on trawl bycatch arrangements in the PFMP 2010 when the venture companies were compelled to sell the fish bycatch to the small scale fishers. Moreover, studies showed that there was no significant change in catches and incomes of the small-scale prawn fisheries even after the ban (Munga et al., 2011). Evidently, various approaches such as zoning, control on fishing calendars for trawls and small-scale fishers, establishments of mechanisms for faster reporting and compensation for damaged gear, and participation of community and conservation groups in monitoring impacts of trawling in the bay are practical ways in which the conflicts have been tackled, calling for efforts to develop a more domestic fleet for the fishery.

4.3.2 SMALL SCALE PRAWN FISHERY PRE-ASSESSMENT RESULTS

4.3.2.1 Principle 1: Sustainability of the Exploited Fishery Stocks

The small-scale shallow water prawn fisheries (including the inshore creeks) are mainly inshore coastal waters and in the mangrove creeks supporting ≈ 900 fishers along the entire Kenyan coastline. In the Malindi-Ungwana bay, the fishery accounts for over 41% of the total prawn production. There is no evidence of local-fisher investments in the semi-industrial/commercial fisheries subsector. The catch rates average at 2.17-

5.65kg/fisher/day (based on routine fishery surveys) suggesting that between ≈ 527 Mt and 1200Mt of prawn catch is landed annually. Current fishing effort (F_{CURR}) is estimated 2.8x the effort at MSY (F_{MSY}) for *P. indicus* and 1.1x for *P. monodon* species suggesting very high fishing pressure for the target species. The yield per recruit (YPR) is currently around the yield at MSY for both species; *P. monodon* $\text{YPR}_{\text{CURR, MSY}} = 0.23$, *P. indicus* $\text{YPR}_{\text{CURR, MSY}} = 0.26$. The inshore fisheries land a lot of juveniles with likely growth overfishing, partly attributed to the gears used. The juveniles of the species are mainly planktonic within the inshore until the early maturing stages when they migrate to deeper waters to breed. There is a harvest strategy in place with closed seasons and robust harvest control rules (HCRs) for sustainable exploitation of the trawl fisheries but none targeted at the small scale prawn fisheries. Further, within the semi-industrial trawl fishery, there is a monitored stock rebuilding strategy of a five (5)- month closure period, with no restrictions are in place for the small-scale prawn fisheries. Therefore, management measures specific to the inshore small-scale prawn fisheries should be enacted, supported by in-depth assessments of the effectiveness of the closures on stock recovery and yields. Fishery monitoring with good data and information on resource exploitation is in place for the Malindi-Ungwana Bay fisheries but not for other inshore fisheries. Fairly extensive stock assessments of stocks for the Malindi-Ungwana Bay prawn fisheries have been conducted and data on established reference points and exploitation rates is available, with any uncertainties in data and information explained.

Table 11. Shallow Water Prawn Fishery Summary Conservative scores for Principle 1 PIs

P1	Outcome	1.1.1	Stock status	60-79
		1.1.2	Stock rebuilding	60-79
	Management	1.2.1	Harvest strategy	<60
		1.2.2	Harvest control rules & tools	60-79
		1.2.3	Information & monitoring	60-79
		1.2.4	Assessment of stock status	>80

4.3.2.2 Principle 2: Maintenance of the Fishery Ecosystems and Habitats

Based on assessments, the primary stocks currently indicate a good stock status; *M. monoceros* accounts for 11.5% of the total penaeid shrimp catch compared to *M. stebbingi* (3.2%) and *P. semisulcatus* (5.1%). There are existing management strategies for the primary species including mesh size regulations on cod-end seine nets. Generally, adequate data is available, and some stock assessments have been done to establish reference points to effectively assess the impacts of the fishery on the minor primary species. However, extended stock monitoring and stock assessments of the secondary minor species should be conducted to update the initial reference points. There is no management strategy targeting the secondary species but some information is available to infer the effects of the fishery on secondary species. ETPs are protected by both national and international instruments which guide the domestic instruments for the

management of the small-scale prawn fishery. However, due to the protected nature of the ETPs, information on bycatch is scanty, making it difficult to assess the likely impacts of the fishery to ETPs. The harvest strategies in the fishery are periodically reviewed and implemented, adopting alternative measures to minimize potential mortalities of ETP species. Some of the gears used e.g. seine nets and small-mesh mosquito nets have some low impacts especially on the inshore areas and sea grass beds with likely detrimental impacts to the ecosystems and habitats.

Management measures to protect the ecosystems and habitats are in place but only implemented at low levels with no monitoring and evaluation. The Prawn Fishery Management Plan (2010) is in place for management of the semi-industrial fisheries but has little reference to the regulation of the inshore small-scale prawn fisheries. Based on the operations of the prawn gears, the impact on ecosystems is deemed minimal. However, the huge numbers of small-scale fisheries within limited inshore waters and creeks may be detrimental to the recruitment of the juveniles to adult populations that migrate into the deeper waters to breed.

Table 12. Shallow Water Prawn Fishery Summary Conservative scores for Principle 2 PIs

P2	Primary species	2.1.1	Outcome	60-79
		2.1.2	Management strategy	60-79
		2.1.3	Information/Monitoring	>80
	Secondary species	2.2.1	Outcome	<60
		2.2.2	Management strategy	<60
		2.2.3	Information/Monitoring	<60
	ETP species	2.3.1	Outcome	60-79
		2.3.2	Management strategy	60-79
		2.3.3	Information strategy	60-79
	Habitats	2.4.1	Outcome	<60
		2.4.2	Management strategy	<60
		2.4.3	Information	<60
	Ecosystem	2.5.1	Outcome	60-79
		2.5.2	Management	<60
		2.5.3	Information	>80

4.3.2.3 Principle 3: Effective and Responsible Management of the Fishery

The Prawn Fishery Management Plan (2010) is in place and can deliver management outcomes consistent with MSC Principles 1 and 2. Resource-use conflicts and dispute resolution have been effectively outlined in the revised BMU regulations embedded in the Fisheries Management and Development Act 2016. The Act further identifies organizations and individuals involved in the management process with clear definition of functions, roles and responsibilities. There are regular consultation processes in the

management of the fisheries that seek and accept relevant information, and provide opportunities and encouragement for all interested and affected parties. The long-term objectives required to guide decision-making processes are clearly defined and incorporate Ecosystem Approach to Fishery (EAF) management. Within the fishery, effective Monitoring Control and Surveillance (MCS) mechanisms are generally in place with land-based surveys as well as on-board observers for the semi-industrial fisheries. Sanctions to deal with non-compliance exist but are not specific to small-scale prawn fisheries. The PFMP 2010 is reviewed regularly.

Table 13. Shallow Water Prawn Fishery Summary Conservative scores for Principle 3 PIs

P3	Governance & policy	3.1.1	Legal &/or customary framework	60-79
		3.1.2	Consultation, roles & responsibilities	>80
		3.1.3	Long term objectives	>80
	Fishery specific management system	3.2.1	Fishery specific objectives	60-79
		3.2.2	Decision making processes	60-79
		3.2.3	Compliance & enforcement	60-79
		3.2.4	Monitoring & Management	<60

4.3.3 SMALL SCALE PRAWN FISHERY BMT TOOL ANALYSIS RESULTS

Pre-assessment results show that only five (5) Performance indicators (PIs): Assessment of stock status (PI 1.2.4), Primary species information (PI 2.1.3), Ecosystem information (PI 2.5.3), Consultation, roles and responsibilities (PI 3.1.2) and Long term objectives (PI 3.1.3) scored ≥ 80 while nine (9) PIs scored < 60 and 14 PIs scored 60-79. The detailed assessments results are shown in the Appendix 7.

The overall BMT score for the Small-scale Prawn fisheries is 0.43, an indication of a fishery fairly running on the edge of maximal yields, but with increased uncertainty about its long-term sustainability especially with regards to maintenance of the fishery ecosystems, if not properly monitored and management measures enacted. The score for Principle 1 is 0.50; P2=0.33 & P3=0.57 indicating fair performance of the fishery with regards stocks sustainability of the fishery and governance and management, but with dismal performance on maintenance of the ecosystems supporting the fisheries. FiPs under the KEMFSED Project should therefore put more emphasis on assessment of the ecosystems, especially the impacts of prawn seine nets on breeding and nursery grounds to steer the fisheries stocks to sustainability. The results of the BMT analysis are shown in Figure 10 while the projected benchmarking for the fishery over the five (5) year period (2019-2023) is shown in Figure 11. The full MSC's BMT tool baseline results and 5-year projections for Small-scale Prawn fishery are shown in Appendix 8.

		Unit of Assessment		
Fishery Name:	SMALL-SCALE PRAWN FISHERIES	Species	Area	Gear type
FIP provider:	KEMFSED PROJECT	<i>P. indicus</i>	KWL, KLF, LMU	Prawn seines
Pre-assessment undertaken by:	DR. BERNERD M. FULANDA	<i>P. monodon, Metapenaeus spp.</i>		
Action plan undertaken by:				
BMT undertaken by:	DR. FULANDA / KEMFSED TEAM			
Date of BMT:	12TH MARCH, 2019			

Actual BMT index summary table

Last update: Year 1

Scoring Level	All PIs	Principle 1 Number of PIs	Principle 2 Number of PIs	Principle 3 Number of PIs
≥80	5	1	2	2
60-79	14	4	6	4
<60	9	1	7	1
BMT Index	0.43	0.50	0.33	0.57

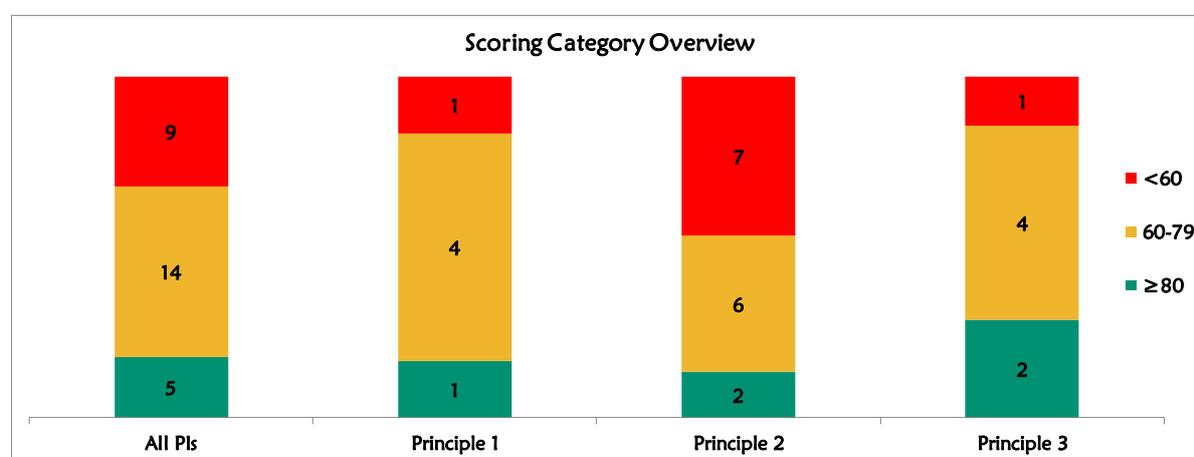


Figure 10. MSC’s BMT Tool Results for Sustainability of the Kenya Marine Small-scale Prawn Fishery

Actual vs. Expected BMT index table

		BMT Index				
		2019	2020	2021	2022	2023
Principle 1	Actual	0.50				
	Expected		0.50	0.50	0.67	0.83
Principle 2	Actual	0.33				
	Expected		0.33	0.43	0.63	0.87
Principle 3	Actual	0.57				
	Expected		0.57	0.79	0.86	0.93
Overall	Actual	0.43				
	Expected		0.43	0.54	0.70	0.88

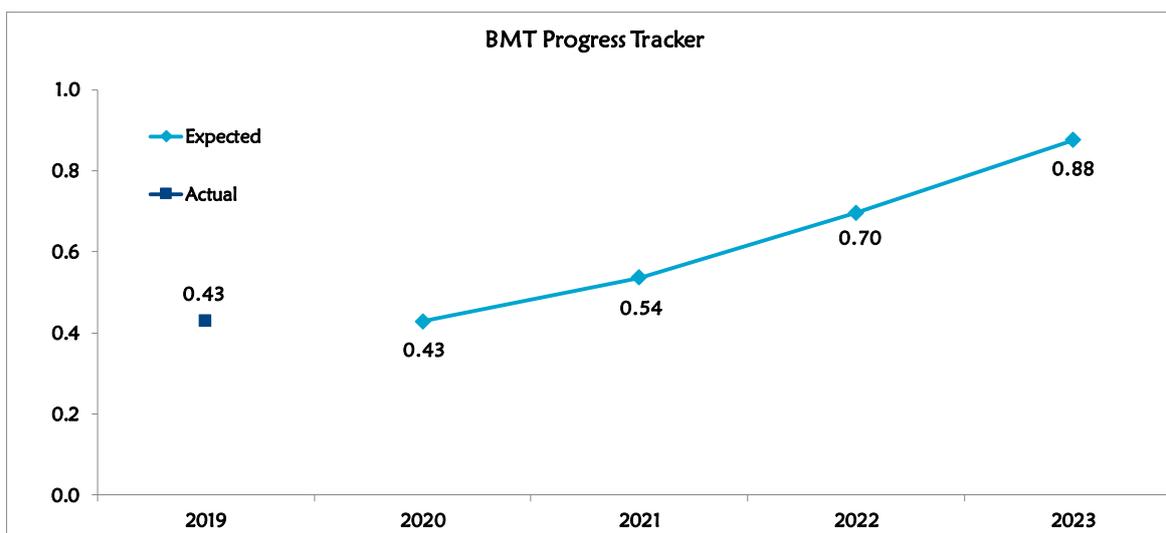


Figure 11. MSC’s BMT Tool Forecast for Improvement of the Kenya Marine Small-Scale Prawn Fishery

4.3.4 CONCLUSIONS AND RECCOMENDATIONS

The UoA was considered to be performing better than other fisheries at 0.43 BMT index but far from attaining sustainability. Principle 1 and 3 scored high, suggesting that FiPs under the KEMFSED project should focus more on Principle 2; consideration of the ecosystems and habitats supporting the fishery, with sustainability of the stocks and effective governance and management more likely to push the fishery to achieve sustainability. The key areas of concern are the assoicated fishery operations e.g. over exploitation in creeks and inshore using mosquito nets and undersized monofilament gears thus negatively impacting on the maintenance of the structure, productivity, function and diversity of the ecosystems. Moroeover, data to gauge the level of impacts is still scanty while targeted management of the associated ecosystems, habitats, primary, secondary and ETP species in relation to the fishery is evidently lacking. Landed sizes are undersized suggesting likelylihood growth and recruitment overfishing within the creeks and inshore waters especially for the main species *Penaeus monodon* and *P. indicus*. Evidently, the Prawn Fisheries Management Plan covers little of the small scale prawn fisheries and focuses only on the trawl fisheries.

Trawl bans have caused significant economic losses in terms of foreign exchange, employment, licence fees and sea food. Moreover, there has been no significant change in catches and incomes of the artisanal prawn fisheries. However, the bans have greatly addressed resource-use conflicts as well as impacts of trawling on the environment, but full evaluation is difficult due to limited scientific data and information on the spawning grounds. It is noted that Kenya must maximize the use of all available resources in the fight against abstract poverty among the coastal poor, hence the need to develop and revamp the small scale fisheries to exploit the trawling grounds amid, sustainably. Therefore, FiPs in the KEMFSED project should focus on re-evaluations of the bans and current management structures, conduct extensive studies and periodic reviews to quantify both artisanal and industrial landing for their effective management and to decipher possible impacts on the structure, productivity, functioning and diversity of interacting ecosystems with more focus on ETPs. To reduce the high pressure on the main species, gear improvements and design are a necessity, especially within inshore waters, while taking into consideration by-catch challenges and associated potential impacts on ETPs.

4.4 OCTOPUS FISHERY

4.4.1 FISHERY DESCRIPTION AND CHARACTERIZATION

4.4.1.1 Description of the Fishery

The Octopus fisheries along the Kenya coast run from the coastline to the edge of the continental shelf with majority of the fishing occurring in the intertidal reef flats and sub-tidal reefs during low water tides. Although there are more than 300 species of Octopus reported globally, only three; Bigblue *Octopus cyanea*, the Common *O. vulgaris* and the White-spotted *O. macropus*. Within the coastal habitats, the Octopus inhabit the continental shelf sandy/muddy tidal flats, mangroves, coral reefs, rocks intertidal platforms, sea grass beds, lagoons and estuaries. The species is benthic cephalopod distributed on muddy, rocky and sandy bottoms this species occurs offshore to depths of around 40 m. It is omnivorous and the sexes are separate. Breeding occurs between November and June. The larvae are planktonic (settling in July or August, and then begin to breed in February of the next year. Like all cephalopods, *O. vulgaris* is intelligent active predator with modified salivary glands that produce venom used to incapacitate prey. They are terminal spawners, with a merobenthic life-history strategy of >100,000 eggs in a single. The small hatchlings go through a planktonic 'para-larval' stage prior to settling on the benthos. Adult common octopus is normally solitary and territorial during spawning seasons. According to Anderson et al. (2003), female common octopus die soon after their eggs hatch due to starvation and massive decrease in their digestive gland weight and the entire life cycle lasts ≈12-15 months

(Katsanevakis & Verriopoulos, 2005). A detailed characterization of the Octopus fishery is shown in Table 14.

Table 14. Characterization of the Octopus Fisheries

Fishers Scale & types	Small-scale, mainly within the reefs and nearshore coral reefs; spear guns are the common fishing methods, accounts for 24% of fishers in south coast Kenya; There's no existing semi-industrial/ industrial fisheries although venture companies bring fishers onboard for commercial fishing though at small scale
Primary target species	Big Blue Octopus <i>Octopus cyanea</i> & Common octopus <i>O. vulgaris</i> & White-spotted octopus <i>O. macropus</i>
Main Secondary species	Secondary target: not known
Bycatch species	Main species in bycatch: Rays, goatfishes, parrotfishes, squids. Information poor
Fishing gears	Main gear: spear guns, harpoons & hooked stick ($\approx 1.0-1.5$ m long); second after basket traps in terms of total catch (kg) landed; A scoop net is used in addition to spear or harpoon during fishing operations Other gears: Monofilament; Use of hands; Octopus are also known to be tangled up in netting and other types of fishing equipment and may drown easily as they struggle to break free. Their bodies can be severely injured as well so they are no longer able to move around and get prey as they must if they are going to survive.
Fishing gear / Fishery interactions	-Gear interactions: Handlines, basket traps, spear guns, reef seines and aquarium fishers; conflicts with basket traps & gillnets (theft of catch), aquarium fish divers (destruction of corals); beach seines (access to fishing grounds) -Conflicts with other fishers & the management; spear gun gear damages corals when they miss the target & by trampling as the fishers have direct walk on live corals. -Other fisheries that also occur in the same fishing grounds e.g. diving, hand/scoop net for ornamental fish & lobsters, spear gun fishing - Basket traps, cast and gill nets and monofilament capture octopus as by-catch (Kimani et al 2018). Octopus are also caught as bycatch in bottom shrimp trawl fishery
Issues on ETPs	Interactions with ETPs not documented however, Octopus' fishers are reported to also pick sea cucumber species and marine shells. The quantities are very low
Fishing vessels	Mainly foot fishers /gliders in the shallow areas; majority go as crew in motor boats owned by fishing companies/agents. Sail boats, outriggers and canoes are also used
Fishing grounds	Species habitats range from shallow tidal pools to ocean depths of ≈ 200 m; mainly within the reefs, in crevices, coral gardens etc. Most fishing takes place in the intertidal reef flats and subtidal reefs during

	low water spring tides with main grounds being coral reef bommies, coral reef platform, coral reef slopes, general reef shore area & rocky seabeds.
Ecosystems/Habitats	<p>Issues on Ecosystems/Habitats: fishing method is either by walking over the lower reaches of the intertidal reef flat or by snorkeling along the reef edge with some degree of impacts on the fishing grounds; however, with the reduction in number of days that an area is fished when conditions are not favourable (SEM), some recovery of reefs flat is evident along the Kenyan coast, some increase in reef fish catches. In addition, most of the fishermen in south coast are running trials with bamboo octopus' traps with a view to introducing these as a less destructive fishing method.</p> <p>Fisher Issues: harpoons are lost when visibility is poor but do not contribute to ghost fishing; With entry of processors and foreign buyers in recent years, fishing intensity for octopus has risen markedly, placing greater pressure on the target species;</p>
Fishing seasons	All year round; NEM and SEM, though reduced frequency during SEM when fishers shift to shallower waters, and shifting further deep during NEM
Fishing operations	Fishing grounds are accessed mainly by gliding (walking through chest deep water, skin diving); fishing spear/hooked stick, ranging from 1.0-1.5 m long is used to pry out the octopus from its hole. Once freed from the hole, the octopus is then killed by use of the spear or a wooden club; Common octopuses are captured predominantly during low spring tides
Geographic Extend of the fishery	Spatial expanse of the fishery from Frame Survey incl. data; Kwale (Vanga-Shimoni-Msambweni-Diani) to Kilifi, Malindi and Lamu; Highest concentrations in Vanga-Shimoni, Kilifi-Malindi and Lamu-Kiunga.
Fishing Effort & levels of Exploitation	<p>No comprehensive studies have been done to triangulate results on fishing effort for octopus in Kenya</p> <p>Market: Catch is sold in open-air markets or directly on the beach to local traders & octopus processing companies/ agent for high quality grade made for export; the Lower quality grade octopuses are sold to a number of successive intermediaries along the supply chain: collecting traders, regional traders, wholesalers, and retailers. Prices vary \approx KES 80.00/kg to KES 200/kg</p>
Catch per unit effort (CPUE)	<p>CPUE: $\approx 6.09 \pm 1.4$ kg/fisher/day during NEM & $\approx 3.9 \pm 0.9$ kg/fisher/day in SEM during 2014; Routine fishery surveys suggest ≈ 10.24 kg/fisher/day; There is evidence of increased exploitation of the Octopus species along the coast.</p> <p>Trends show general increase in Octopus and squid landings over recent years; CPUE Vanga 5.33 to 6.52 Kg/fisher, Shimoni 4.80 to 6.04 kg/fisher. Peak lengths of landed Octopus are 60-69.5 cm TL.</p> <p>Landings: Vanga ≈ 75 Mt 2007, Shimoni 140 Mt in 2002,</p>

	Annual production 1600- 2000 Mt (2063 Mt Fisheries Bulletin 2016)
Biological data	<p>-Female length at first maturity \approx10.8 cm DML, male \approx10.5 cm DML.</p> <p>-common sizes \approx1.0m from mantle to the tips of its arms; An adult can weigh \approx3-6 Kg; Mantle can reach \approx25cm long, and tentacles \approx 1 m long, some may reach L_{∞} =3 m in TL</p> <p>-DML class size frequency distribution for females commonly landed ranges from \approx5 to 24 cm with 10-12cm DML as the dominant size classes (Kivengea 2014); -Landed sizes \approx0.5-5.5kg Body weight with \approx0.5-1.0 kg size classes being predominant in catch; Sizes declining in most fisheries, with lower DMLs landed during July-Sept; -The mean fecundity was $154,057 \pm 29$ eggs/adult</p> <p>- sex ratio is skewed to more females and hence high vulnerability of the spawning (Kivengea 2014); Spawning: throughout the year, peak Jun – Aug</p>
Stock Assessment	<p>- Current status of octopus stocks in Kenya is unknown (suspected to be fully exploited; FAO (2009)</p> <p>-Recent study by Kivengea, 2014 indicate that stocks are undergoing heavy fishing pressure.</p> <p>- studies are needed to collect the necessary data for a quantitative stock assessment</p>
Management / Legislation / Governance	<p>-No existing management plan for the octopus' fishery though some regulations on the Octopus as bait are captured in the Lobster fishery</p> <p>-No management zones are set for the fishery</p> <p>-no restrictions although spear guns remain illegal spears and harpoons are very destructive to coral reef habitats.</p> <p>-some recovery of resting reefs is evident along the Kenyan coast, some increase in reef fish catches.</p> <p>-In addition, most of the fishermen in south coast are running trials with bamboo, Octopus traps with a view to introducing these as a less destructive fishing method</p> <p>-With no agreed plans, fishers use their normal single permits to fish any fish from the marine waters; need to establish a specific licensing scheme would help to provide better information on catch and effort that is needed for management.</p> <p>-It would also permit regulation of fishing effort by restricting numbers of licenses.</p> <p>-Maximum size limits has not been considered, although this has also been said to be difficult to implement as the value of octopus increases with weight thereby complicating efforts in streamlining the octopus fishery.</p> <p>The export market demand octopus encourage large octopus but no formal implementation.</p> <p>Electronic catch monitoring for octopus is implemented through the exporting companies</p>

	Kivengea 2014. Proposed the introduction of minimum size limits: 10.8 DML Females, 10.5 DML Males; Introduce a seasonal closure
Data & MCS	- KMFRI CAS monitoring technical report 2018; PhD study by GM Kivengea provides the only available published data and information on the fishery, with data from 2010-2013. Fisheries department routine data exist but not linked to effort or at species level

External factors affecting stock

The Cephalopod fishery is very active along the entire coast from Kwale (Vanga-Shimoni-Msambweni-Diani) to Kilifi, Malindi and Lamu. The highest concentrations of fisheries are found in Vanga-Shimoni, Kilifi-Malindi and Lamu-Kiunga. Landings are seasonal with higher landings during the NEM period. The rough waters and poor visibility during the SEM season also contribute to the low catches. Some of the fishers go fishing on foot, to fish in the shallow areas, while the majority goes as crew in FRP boats owned by the fishing companies or agents. Other small vessels including Sail boats, outriggers and canoes are also common. Octopus fishing at the Kenyan South coast is predominantly done by small-scale fishers and it is concentrated only in the intertidal zones putting a lot of pressure on the coastal stocks, with few fishers going beyond the territorial waters. The sub-tidal Octopus resources along the coast are therefore virtually unexploited.

All species of octopus are categorized as target species, with the primary species caught being *Octopus cyanaea*. Octopus are also used as bait lobster fishing; hence the lobsters can partly be considered as targeted by-catch species. The main lobster species are of *Panulirus homarus*, *P. ornatus*, *P. penicillatus*, *P. versicolor* and *P. longipes*.

4.4.1.2 Management of the Octopus fishery

4.4.1.2.1 Management bodies

Fishery resources in Kenya are managed by the Department of Fisheries through the Fisheries Management and Development Act of 2016. Fisheries research is the mandate of Kenya Marine Fisheries Research Institute. At the landing sites, resource management is under the mandate of Beach Management Units (BMUs) as guided by the co-management structures in BMU (2007) regulations to ensure sustainability through recognition of resource-user rights. Generally, SDFA&BE is mandated to oversee the development, management, exploitation, utilization, and conservation of the Kenyan fisheries resources.

4.4.1.2.2 Fisheries Regulations

In addition to the general regulations including the Fisheries Management and Development Act 2016 which guides resource management, ecosystem protection and conservation, other institutions in Kenya, such as the Kenya Bureau of Standards (KEBS),

also implement additional regulations in governing octopus' production, handling and packaging. Additional standards may include guidelines by associations such as Kenya Fish Processors and Exporters Association (AFPEK).

4.4.1.2.3 Key Stakeholders

The key stakeholders in the fishery include the fishery/environmental management bodies, fishing industry, academia, other state and non-state actors. Furthermore, the Octopus industry is now governed directly by at least six sets of standards operated through several national agencies and the European Union (EU), the latter having the most significant regulations on the fisheries sector. The regulations are based on HACCP principle, and define the practices governing Octopus production, handling, packaging, and transporting of fishery products destined for EU. HACCP also imposes strict standards regarding construction of buildings, equipment, purification tanks, storage tanks intended for holding octopus prior to export, on-premises laboratories, strict record keeping, and accurate labeling are other requirements.

4.4.2 OCTOPUS FISHERY PRE-ASSESSMENT RESULTS

4.4.2.1 Principle 1: Sustainability of the Exploited Stocks

The stocks are not above the point where recruitment would be impaired, however evidence indicates the landings are just on the verge of tip-over if any additional pressure is introduced; such as L_{mat} & commonly landed sizes of $L_{mat}=10.8\text{cm}$, DML common landed classes are 10-12cm = heavy fishing pressure, though the increasing CPUE trends don't signal a case of overfishing

Table 15. Octopus Fishery Summary Conservative scores for Principle 1 PIs

P1	Outcome	1.1.1	Stock status	<60
		1.1.2	Stock rebuilding	----
	Management	1.2.1	Harvest strategy	<60
		1.2.2	Harvest control rules & tools	<60
		1.2.3	Information & monitoring	<60
		1.2.4	Assessment of stock status	<60

4.4.2.2 Principle 2: Maintenance of the Fishery Ecosystem and Habitats

Data is scanty within the fishery and the status both the main and minor secondary species is unknown. However, the general information on fishery operation suggests that the fishing operations are not likely to reduce the structure, function and productivity of the associated habitats. Furthermore, measures including ecosystem management and surveys are being implemented including establishment of MPAs, CCAs and other co-management areas, evidenced by several studies and in-situ monitoring programmes by WCS, CORDIO, KMFRI etc. Some of the major habitats including sea grass beds, reef ecosystems are well understood. However numerous gaps

on the detailed impact of the fishery on main ecosystems functions, are clear, calling for further investigations to provide adequate information on impacts of UoA on ecosystem elements.

Table 16. Octopus Fishery Summary Conservative scores for Principle 2 PIs

P2	Primary species	2.1.1	Outcome	----
		2.1.2	Management strategy	----
		2.1.3	Information/Monitoring	----
	Secondary species	2.2.1	Outcome	<60
		2.2.2	Management strategy	<60
		2.2.3	Information/Monitoring	<60
	ETP species	2.3.1	Outcome	60-79
		2.3.2	Management strategy	----
		2.3.3	Information strategy	60-79
	Habitats	2.4.1	Outcome	<60
		2.4.2	Management strategy	60-79
		2.4.3	Information	60-79
	Ecosystem	2.5.1	Outcome	60-79
		2.5.2	Management	60-79
		2.5.3	Information	60-79

4.4.2.3 Principle 3: Effective and Responsible Management of the Fishery

Fisheries laws including BMU regulations, ICZM framework, Kenya constitution of Kenya 2010; Wildlife Act, EMCA etc. however some flaws exist in the implementation. The BMUs regulations commits legal rights to resource users with explicitly defined & well understood key areas of responsibility & interaction while the Fisheries Act: calls for EAF approach to management as defined in international agreements; IOTC, UNCLOS, IPOAs etc. However, None of the MCS mechanisms and the BMU laws available is specific to Octopus fisheries hence there is need to develop a comprehensive MCS system and other aspects such as by-catch, conflicts with other fisheries, effort etc. More assessments should be done on research and conflicts resolution with other fisheries. More the Information on the fishery's performance & management action is available on request, with recommendations from research, M&E etc. also more consultations are encouraged, provision of opportunities and facilitation for BMUs, Stakeholders among others

Table 17. Octopus Fishery Summary Conservative scores for Principle 3 PIs

P3	Governance & policy.	3.1.1	Legal &/or customary framework	>80
		3.1.2	Consultation, roles & responsibilities	>80
		3.1.3	Long term objectives	>80
	Fishery specific management system	3.2.1	Fishery specific objectives	<60
		3.2.2	Decision making processes	60-79
		3.2.3	Compliance & enforcement	60-79
		3.2.4	Monitoring & Management	<60

4.4.3 OCTOPUS FISHERY BMT TOOL ANALYSIS RESULTS

Pre-assessment results show that only three (3) Performance indicators (PIs) on governance and policy i.e. Legal and/or customary framework (PI 3.1.1), Consultation, roles and responsibilities (PI 3.1.2) and Long term objectives (PI 3.1.3) scored ≥ 80 , while (11) PIs scored < 60 and (9) PIs scored 60-79. The detailed assessments results are shown in the Appendix 9.

The overall BMT score for the Octopus fisheries is 0.33, an indication of a fishery performing poor with non-conformity to sustainability outcomes, and increased uncertainty about its long-term sustainability. The score for Principle 1 is 0.00; P2=0.32 & P3=0.57 indicating very poor performance for the principle 1 - Sustainability of the exploited fishery stocks and Principle 2 - Maintenance of the ecosystems and habitats supporting the fisheries. The fishery is largely unmonitored and little attention has been paid to stock assessment to ascertain the Status of stocks and whether there was need for Stock rebuilding. The fishery lacks a harvest strategy and HCRs and tools are non-existence. Furthermore, little attention is paid to monitoring of the landings of the specific species. There are numerous number of non-designated sites landings sites for the Octopus and cuttlefishes, especially within the shallow water fishing grounds within the Mangrove creeks of the Vanga-shimoni coast, Gazi, Mida creek, Gongoni to Lamu, in addition to the use of the Octopus as bait in the lobster fisheries. The design of FiPs under the KEMFSED Project should therefore concerted efforts to improving all the performance indicators for the fishery in order to steer the fisheries stocks to sustainability, and improve on the Maintenance of the fishery ecosystems and habitats. The results of the fishery BMT analysis results are shown in Figure 12 while the projected benchmarking for the fishery over the five (5) year (2019-2023) is shown in Figure 6. The full MSC's BMT baseline results and 5-year projections for *T. albacares* tuna fishery are shown in Appendix 10.

		Unit of Assessment		
Fishery Name:	OCTOPUS	Species	Area	Gear type
FIP provider:	KEMFSED	<i>Octopus cyanea</i>	ALL Coast	Hooked stick
Pre-assessment undertaken by:	DR. BERNERD M. FULANDA	<i>O. vulgaris</i>		Speargun, Harpoon
Action plan undertaken by:				
BMT undertaken by:	DR. FULANDA / KEMFSED TEAM			
Date of BMT:	12TH MARCH, 2019			

Actual BMT index summary table

Last update: Year 1

Scoring Level	All PIs	Principle 1 Number of PIs	Principle 2 Number of PIs	Principle 3 Number of PIs
≥80	3	0	0	3
60-79	9	0	7	2
<60	11	5	4	2
BMT Index	0.33	0.00	0.32	0.57

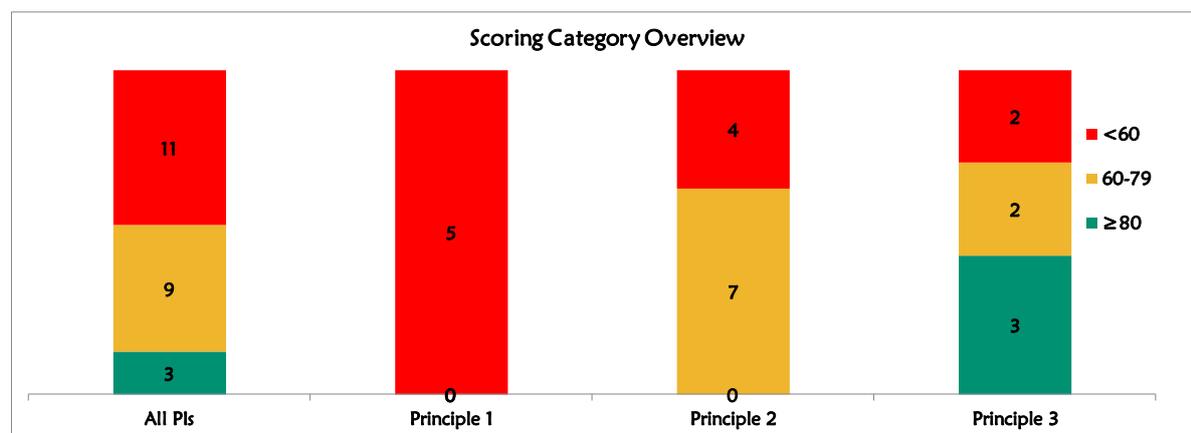


Figure 12. MSC’s BMT Tool Results for Sustainability of the Kenya Marine Octopus Fishery

Actual vs. Expected BMT index table

		BMT Index				
		2019	2020	2021	2022	2023
Principle 1	Actual	0.00				
	Expected		0.20	0.30	0.30	0.70
Principle 2	Actual	0.32				
	Expected		0.32	0.45	0.59	0.86
Principle 3	Actual	0.57				
	Expected		0.57	0.71	0.86	0.93
Overall	Actual	0.33				
	Expected		0.37	0.50	0.61	0.85

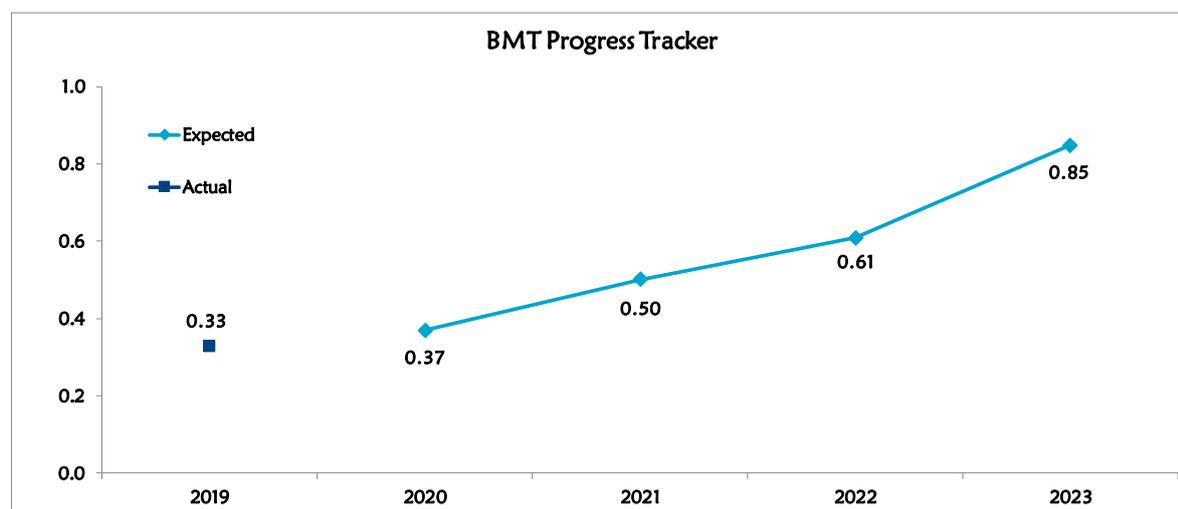


Figure 13. MSC’s BMT Tool Forecast for Improvement of the Kenya Marine Octopus Fishery

4.4.4 CONCLUSIONS AND RECCOMENDATIONS

The fishery is evidently performing dismally (BMT index 0.35), and the information on the sustainability of the exploited stocks is totally (Principle 1 score = 0). Heavy fishing pressure is reported in most areas especially near-shore areas within mangroves such as Mswambeni, Mida creek and the Lamu archipelago. The stock status is unknown but is suspected to be fully exploited nevertheless, not overfished. The recorded landings indicate that the fishery is at a verge of a tip over if additional pressure is introduced without efficient control and management. There is lack of a targeted fishery management strategy, or harvest strategy for primary and secondary species. Little or no effort has been focused on stock assessments and the associated ecosystems. The lack of adequate data and information makes it difficult to gauge the performance of the fishery.

Under the KEMFSED project therefore, it is important to establish an effective system for octopus catch data collection and analysis by strengthening e.g. CAS program within the BMUs, training data enumeration to record species specific information for the Octopus fishery. Provision of the necessary data collection tools and skills including equipment e.g. scales, species identification sheets, incorporation of Octopus’ fishery

into mobile reporting technologies etc. Additionally, there is need to ensure regular scientific monitoring and evaluation of the fishery hence the FiPs should put emphasis in building capacity for monitoring, control and surveillance especially for the small scale fisheries. Notwithstanding, a Risk Based Framework is a necessary need for the target species so as to identify the environmental impacts of the UoA, to support the evaluation of the sustainability status of the fishery.

4.5 SNAPPER FISHERIES IN THE NORTH KENYA BANKS

4.5.1 FISHERY DESCRIPTION AND CHARACTERIZATION

4.5.1.1 Description of the Fishery

The North Kenya Banks (NKBs) potential as an important commercial fishery date back early investigations by the then East African Marine Fisheries Research Organization (EAMFRO) into the resources of the coast of East Africa, which located the hitherto uncharted waters with rich fish stocks off the vicinity of Lamu; later designated as the North Kenya Banks (Wickstead, 1961). The major species exploited by the fisheries include Ruby snapper *Etelis coruscans*, the Deep-water Red snapper *Etelis carbunculus*, the Pink/Crimson snapper *Pristipomoides filamentosus*, the Green job fish *Aprion virescens*, the Dane seabream *Porcostoma dentate*, Yellow tail amberjack *Seriola lalandi* & Moustache grouper *Epinephelus chabaudi*.

In addition to the North Kenya Banks, extended snapper fisheries also occur in the scattered grounds off the Tana River mouth, the Malindi-Ungwana Bay, Watamu coast, off Vuma in Kilifi creek waters, Mombasa Diani and Shimoni in the south coast. The Snapper fisheries are located off rocky reefs on the continental shelf in water depths in range of ≈ 90 to 400 m. *Etelis coruscans* grows upto 70cm TL (40cm TL are the commonly landed sizes) inhabiting rocky bottoms of depths between about 100 and 300 m. *Etelis coruscans* feeds on small fishes, squids and crustaceans (Brouard & Grandperrin, 1984). *Etelis carbunculus* inhabits rock and rocky reefs near the benthic zone on the continental shelf, feeding on fish and other large invertebrates (shrimps, crabs and squid) as well as planktonic organisms (Haight et al. 1993).

There is inadequate information on the life cycle of the *Etelis* species but *Etelis carbunculus* is considered a slow grower, long-lived with low overall productivity. The longevity is estimated ≈ 13 years. The size at first maturity is estimated as ≈ 29 cm TL while massive maturity occurs at ≈ 66 cm TL, taking 5-6 years. The spawning is thought to occur over a protracted period, with peak in July to September (Everson 1984), with a high fecundity of < 1 million / year (Brodziak et al. 2011). *Etelis* species are non-migratory and tend to have patchy distributions, from solitary, small group concentrations to schools and large aggregations to the substrate seeking shelter in large holes or crevices. Groupers of the *Epinephelus* and *Atherinomorus* genera are among primary species retained as bycatch in the Snapper fisheries. The species mostly inhabit

the reefs at depths of 125-200m. They feed mainly on small fishes, shrimps, and crabs. Spawning occurs during restricted periods with spawning aggregations during April to July and October through December. The size at maturity is estimated at as ≈ 61 cm. They exhibit external fertilization laying eggs in open waters where the larvae are pelagic.

ETPs in the snapper fishery include pelagic sharks; *Carcharhinidae* and *Sphyrinidae* families with the Blacktip shark *Carcharhinus melanopterus* and Blue shark (*Prionace glauca*) as main species. The *C. melanopterus* is a brackish, marine, reef-associated and amphidromous fish, which occur at 25-75m, inhabiting shallow waters on coral reefs, intertidal zone and mangrove areas moving in and out with the tide. They feed on crustaceans, cephalopods and other mollusks. The sharks are viviparous, giving birth to 2-4 pups after an 8-9 months' gestation period. Size at birth ranges 33-52 cm. The Blue shark *Prionace glauca* inhabits depths of 150m-1000m but it may also occur close inshore where the continental shelf is narrow. It is viviparous with a sexual dimorphism occurring in the skin thickness of maturing and adult females. They become sexually mature at ≈ 250 cm TL and female can give birth ≈ 80 young ones. Gestation period ranges 9 to 12 months. The Hammerhead shark *Sphyrna lewini* is a coastal shark occurring in continental and insular shelves and adjacent deep water, often approaching close inshore and entering enclosed bays and estuaries, at a depth range of 25m to 1000m. It feeds on teleost fishes, cephalopods, lobsters, shrimps and crabs. Spawning occurs from July to November.

Most rays occur on or near the bottom though some species may occur in the pelagic zones occurring as bycatch in Snapper species; *Dasyatidae* (*Taeniura lymma* species) and *Myliobatidae* (*Rhinoptera javanica*) are the main ray families landed. *Taeniura lymma* occurs at depth ranges of 1m to 20m, feeding on mollusks, worms, shrimps, and crabs. It is ovoviparous and can bear up to 7 young ones. *Rhinoptera javanica* is a reef species, that feeds on clams, oysters and crustaceans. Like T. lymma, it exhibits ovoviparity. Table 18 gives a summary characterization of the Snapper fisheries in the north Kenya Bank

Table 18. Characterization of the Snapper Fishery in the North Kenya Banks

Fishers Scale & types	Small-scale, mainly offshore within the North Kenya banks, deeper water fishers off the reef; Presents entry of the new generation fishers (only the well-equipped going to these fishing grounds; most of the fishers supply fish traders or specific larger-scale fish orders from hotels and cottages or individuals during peak seasons esp. peak tourist seasons & holidays
Primary target species	Deep water longtail Red Snapper <i>Etelis coruscans</i> (58%), Green job fish <i>Aprion virescens</i> (34%), Dane seabream <i>Porcostoma dentate</i> (4%). Yellow tail amberjack <i>Seriola lalandi</i> (4%), Pink or Crimson snapper <i>Pristipomoides filamentosus</i> & Moustache grouper <i>Epinephelus chabaudi</i> (based on Dropline fishery data survey)

Main Secondary species	<i>Argyrops spinifer</i> , <i>Epinephelus flavocaeruleus</i> , <i>Epinephelus poecilonotus</i> , <i>Lutjanus sanguineus</i> , <i>Etelis coruscans</i> and <i>Pristipomoides sieboldii</i> . Other species include <i>Lutjanus</i> spp. (snapper), peacock hind (grouper), emperor spp., tuna, king fish and various other pelagics. Blue trevally
Bycatch species	Main species in bycatch: sharks i.e. <i>Mustelus palumbes</i> ,
Fishing gears	Main gear: Hand lines, long lines and drop lines; recently, trials on demersal dropline fishing gears (vertical longlines) conducted; depths 100-450 m. -Gear consists of 3-4 surface buoys attached to flagged mainline of polypropylene rope that is connected to a weighted terminal rig (Lucas et al., 2012a, b; Mbaru et al., 2013);
Fishing gear / Fishery interactions	Gear interactions: Limited interactions with other fishing gears. Fishing on the banks by hand line fishers is a rather new phenomenon that began in 2013 thanks to new technology of the use of hand held portable GPS devices for providing spatial reference to artisanal fishers operating in offshore waters. However, likely interaction with sport fishery which also targets the same fishing grounds
Fishing vessels	-Due to the rough nature of the seas within the North Kenya banks, only strong sailboats (Mashua) with inbuilt engines and sails, and FRPs with strong outboard engines are used in these fisheries
Fishing grounds	The North Kenya banks are located off the Kenyan coast (latitude 2°50" - 3°00" S; Longitude 40°45" - 40°57" E) located approximately 30 nm from the nearest coastline. NBK is among the most productive fishing areas in Kenya's coastal waters (Ruwa et al, 2003). The productivity of the banks is closely associated with input of nutrient rich waters from the Tana river as well as the upwelling associated with the colder Somali current (Samoilys et al, 2011). The deepwater snapper fishery takes place in cover an area of about 2,100 km ² with fishing taking place in water depths of about 80-130 metres.
Fishing seasons	Fishing takes place all year round both NEM, starting from October to April for artisanal fishers using hand lines. Rough seas restrict access to fishing grounds during the SEM.
Fishing operations	-Involves the use of a single monofilament nylon line with a hook and bait attached, then attached to a pole for the hand line. -A long single monofilament line is attached with hooks & set horizontally to the water surface with bait to trap fish, and then deployed offshore; floats are used to indicate the location of the gear for the long line. -For the drop line, a long single monofilament line is attached with hooks and set vertically through the water with bait allowing the capture species across the oceanic zone -Due to the large distance needed to cover to access the fishing grounds, for safety reasons all fishing vessels depart and exit the fishing ground in groups setting off to the home ports. A typical fishing trip takes 24-30 hr departing the designated landing sites at ten in the night sailing for six hours to arrive at the fishing grounds in the morning. Actual fishing is during the daylight because according to interviews with the fishers the fish baits are mostly eaten during the day
Geographic Extend of the fishery	Spatial expanse of the fishery from Frame Survey incl. data; Kwale (Vanga-Shimoni-Msambweni-Diani) highest, Kilifi. Fishery covers the entire coastline, esp. in Kwale (excl. Tana delta) (Frame survey 2012). The catch is then sold

	locally at the landing sites to dealers and small scale fish traders; Entire coast, mostly south coast and north coast up to Mayungu
Fishing Effort & level of Exploitation	About 30 boats in Kilifi County with other boats also fishing in these grounds departing from landing sites in Lamu.
Catch per unit effort (CPUE)	CPUE: CAS data shows 39.9kg/fisher/day (fisheries statistics/trials, 2015); recent fisher survey indicated CPUE as 10.20kg/fisher/day; indication of decline in catch? overexploitation? Catch rates: Fisher Issues: fairly new fishery, hence little issues raised with the fishery; issues with migrant fishers, like with most fisheries, however still arise Issues on ETPs: Sharks & rays Issues on ecosystem/habitats: Limited impacts of the fishery on the habitats
Biological data	- L_{mat} <i>Etelis coruscans</i> \approx 66.3cm FL & 27.94 cm for <i>Etelis Carbunculus</i> ; evidence of growth overfishing, sustainability of the fishery in question. <i>Aprion virescens</i> Maturity: Lm 44.9, range 42 - 50 cm, Max length : 112 cm; -No stock assessment data for the fishery
Stock Assessment	No stock assessment has been conducted for the fishery
Management / Legislation / Governance	-Limited regulations for the fishery There is no existence of a specific management plan for the fishery. -other management plans which aim at conserving critical marine habitats e.g. National Mangrove Ecosystem Management plan, 2017-2027; an indication that there is a high risk of depletion of the fishery if no management plan is formulated & effectively implemented.
Data & MCS	Data and information specific to this fishery is clearly lacking and there is a need to increase efforts in M&E of the fishery to fill in data and information gaps; more research should be considered for the snapper fishery along the Northern Kenyan banks; need for formulation of, and effective implementation of snapper fishery management plan.

External Factors Affecting the Stock

There is inadequate scientific monitoring of stock status, catch or fishing effort thus limiting information on seasons. Climatic patterns are the single most important factor affecting the fishery, often driving annual migrations resulting of fishers.

Long lines (zulumati), are some of the main fishing gears employed in the snapper fishery. Drift long lines are at times positioned vertically with a series of vertical short baited nylon snoods attached at 5-10m intervals. Fishing vessels in the fishery are majorly non-motorised, with \approx 10% of the vessel motorized (8 - 5 m long; 40-60 Hp outboard engines). Dugout canoes and sailboats are the most prominent fishing crafts in used hence majority of the fishers cannot venture beyond the reef

4.5.1.2 Management of the Snapper Fisheries in the North Kenya Banks

The State Department for Fisheries, Aquaculture and the Blue Economy is the main management body while research is headed by the The Kenya Marine Fisheries Research

Institute (KMFRI). At the local levels, County Fisheries Directorates with well structured BMUs and BMU Network to ensure coordinated approach to resource management. Stipulated responsibilities of BMUs include resolving user conflicts, field patrols, data collection, enumerating by-laws, control of illegal gears and methods, protection of breeding sites and maintenance of high fish quality standards. However, because of the extensive coastline and poor policing on the ground, there is a significant loss in data and statistics. There is also an Exporters Processing Zones Authority, the Fish Inspection and Quality Assurance (FIQA) which is within Kenya Fisheries Service and it is mandated to evaluate the fish quality control. NGOs, such as WWF have established programmes, particularly in Marine Protected Areas (MPAs) such as the Kiunga Marine Reserve that monitor and sample fish catches.

4.5.2 SNAPPER FISHERY (NKB STOCKS) FISHERY PRE-ASSESSMENT RESULTS

4.5.2.1 Principle 1: Sustainability of the Exploited Stocks

The fishery is fairly new with very few fleets exploiting the North Kenya Bank Snapper fishery resources. Although the stock abundance & fishery removals are not monitored, there are indicators (e.g. drop-line gear trials under KCDP project) on productivity of the fishery with catch rates estimated at 10.2-39.9kg/fisher/day (2015 data). This suggests that the stocks are still at a level which maintains high productivity with low probability of recruitment overfishing. However, information on stocks status, productivity, detailed fleet composition etc. is lacking for definition of a harvest strategy and harvest control rules (HCRs). There are no management plans in place for this fishery, though legislations exist for the wider long-line and hand-line fisheries. Stock assessment data for the fishery is lacking calling for extensive assessments to supplement the gear trials and set reference points e.g. MSY , F_{MSY} etc and harvest control rules (HCRs) for definition of management frameworks for the fishery. There is need for RBF for all the species given the scarcity of data on the all the species.

Table 19. Snapper Fishery (NKB) Summary Conservative scores for Principle 1 PIs

P1	Outcome	1.1.1	Stock status	<60
		1.1.2	Stock rebuilding	----
	Management	1.2.1	Harvest strategy	<60
		1.2.2	Harvest control rules & tools	<60
		1.2.3	Information & monitoring	<60
		1.2.4	Assessment of stock status	<60

4.5.2.2 Principle 2: Maintainance of the Fishery Ecosystem and Habitats

Data and information on ecosystems is lacking and there are no management strategies specific ETPs especially sharks and turtles. However, general management strategies for ETPs exist in the wider Fisheries Law (2016) including legislation applied to other line fisheries but there is no evidence of successful implementation. Based on data and information from the KCDP dropline gear trials, the gear has minimal impacts on the

vulnerable marine ecosystems (VMEs) and habitats. The types and distribution of the main habitats in the snapper fishery are broadly understood and some mapping has been done. Adequate data and information on assessments of impacts on habitats is clearly lacking but the fishery is unlikely to disrupt the key elements underlying ecosystem based management. Although there are no evidences of implementation of management strategies for the drop line fisheries, the main impacts of the UoA on key ecosystem elements can be deduced from other line. There are on-going surveys on the fishery, but there is need for extensive stock assessment for all the species to supplement existing data and information.

Table 20. Snapper Fishery (NKB) Summary Conservative scores for Principle 2 PIs

P2	Primary species	2.1.1	Outcome	<60
		2.1.2	Management strategy	<60
		2.1.3	Information/Monitoring	<60
	Secondary species	2.2.1	Outcome	<60
		2.2.2	Management strategy	<60
		2.2.3	Information/Monitoring	<60
	ETP species	2.3.1	Outcome	<60
		2.3.2	Management strategy	<60
		2.3.3	Information strategy	<60
	Habitats	2.4.1	Outcome	<60
		2.4.2	Management strategy	60-79
		2.4.3	Information	<60
	Ecosystem	2.5.1	Outcome	60-79
		2.5.2	Management	<60
		2.5.3	Information	<60

4.5.2.3 Principle 3: Effective and Responsible Management of the Fishery

There is an effective national legal system and a framework for cooperation with other parties, where necessary to deliver management outcomes consistent with MSC principles 1 and 2, including the Fisheries Management and Development Act (2016), BMU (2007) regulations (revised 2016), the ICZM framework (2019-2023), Constitution of Kenya 2010; Wildlife Conservation and Management Act 2013, the Environmental Management and Coordination Act. Cap 387 (Revised 2012). Monitoring, control and surveillance mechanisms exist for the general line fisheries though non-specific to the snapper fishery in the north Kenya Bank. Therefore, sanctions to deal with non-compliance but there is no evidence for application. The fishers generally comply with general management regulations although there are no surveillance mechanisms, management monitoring and reviews for the fishery.

Table 21. Snapper Fishery (NKB) Summary Conservative scores for Principle 3 PIs

P3	Governance & policy.	3.1.1	Legal &/or customary framework	60-79
		3.1.2	Consultation, roles & responsibilities	>80
		3.1.3	Long term objectives	>80
	Fishery specific management system	3.2.1	Fishery specific objectives	<60
		3.2.2	Decision making processes	60-79
		3.2.3	Compliance & enforcement	60-79
		3.2.4	Monitoring & Management	<60

4.5.3 SNAPPER FISHERY BMT TOOL ANALYSIS RESULTS

Pre-assessment results show that only two (2) Performance Indicators (PIs) on Governance and policy in relation to Consultation, roles and responsibilities (PI 3.1.2) and Long term objectives (PI 3.1.3) Scored ≥ 80 , while 20 PIs scored <60 and five (5) PIs scored 60-79. The detailed pre-assessments results are shown in the Appendix 11.

The overall BMT score for the *T. albacares* fishery is 0.17, an indication of a fishery with near-zero conformity to sustainability outcomes and very high uncertainty about its sustainability, both in the short term and long term aspects. The score for Principle 1 is 0.00; P2=0.07 & P3=0.50 indicating very poor performance for the sustainability of the fishery stocks and maintainance of the ecosystems supporting the fisheries. This is partly due to the fact that the fishery is largely new, and that the rapid entry into the unknown and highly unregulated fishery. The design of FiPs under the KEMFSED Project should therefore focus on understanding the species biology, assesment of the stocks and assesment of ecosystem impacts while putting more emphasis on steering the fisheries stocks to sustainability and health of the supporting ecosystems and habitats. The results of the fishery BMT analysis results are shown in Figure 14 while the projected benchmarking for the fishery over the five (5) year period (2019-2023) is shown in Figure 15. The full MSC's BMT tool baseline results and 5-year projections for *T. albacares* tuna fishery are shown in Appendix 12.

		Unit of Assessment		
Fishery Name:	NORTH KENYA BANK FISHERIES	Species	Area	Gear type
FIP provider:	KEMFSED PROJECT	<i>Etelis coruscans</i>	North Kenya Bank	Line, Dropline
Pre-assessment undertaken by:	DR. BERNERD M. FULANDA	<i>Pristipomoides filamentosus, Aprion virescens</i>		
Action plan undertaken by:				
BMT undertaken by:	DR.FULANDA / KEMFSED TEAM			
Date of BMT:	12TH MARCH, 2019			

Actual BMT index summary table
Last update: Year 1

Scoring Level	All PIs	Principle 1 Number of PIs	Principle 2 Number of PIs	Principle 3 Number of PIs
≥80	2	0	0	2
60-79	5	0	2	3
<60	20	5	13	2
BMT Index	0.17	0.00	0.07	0.50

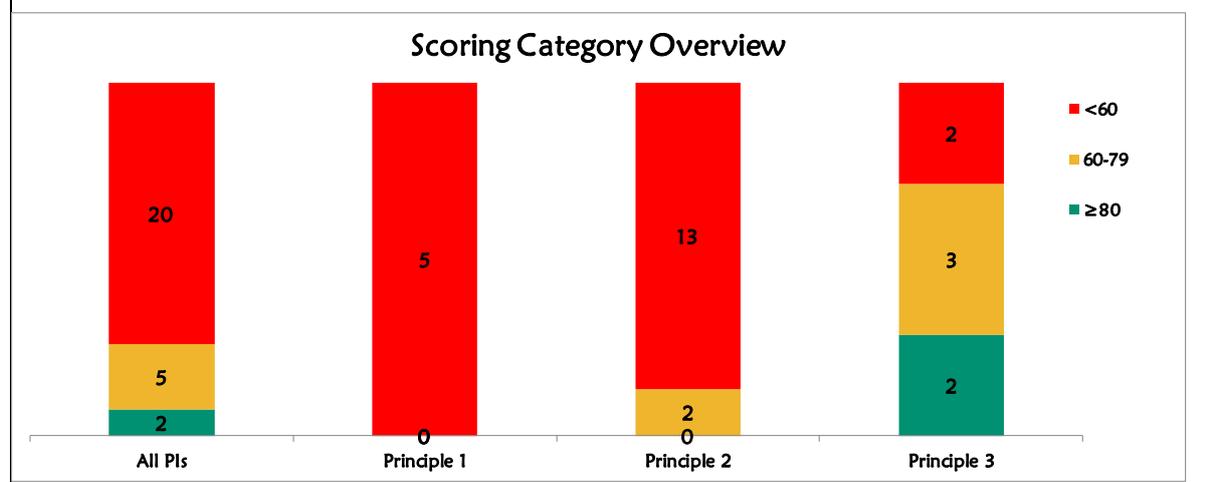


Figure 14. MSC’s BMT Tool Results for Sustainability of the Kenya Marine NKB Snapper Fishery

Actual vs. Expected BMT index table

	BMT Index					
	Year 1	Year 2	Year 3	Year 4	Year 5	
Principle 1	Actual	0.00				
	Expected		0.00	0.20	0.40	0.70
Principle 2	Actual	0.07				
	Expected		0.23	0.37	0.70	0.87
Principle 3	Actual	0.50				
	Expected		0.50	0.57	0.79	0.93
Overall	Actual	0.17				
	Expected		0.26	0.39	0.67	0.85

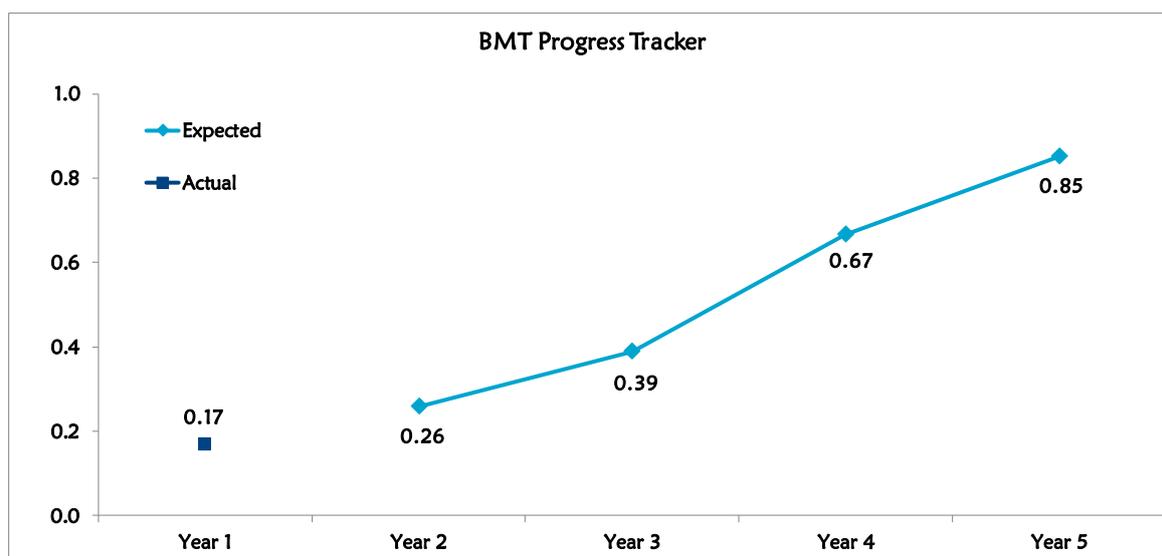


Figure 15. MSC’s BMT Tool Forecast for Improvement of the Kenya Marine NKB Snapper Fishery

4.5.4 CONCLUSIONS AND RECCOMENDATIONS

The North Kenya Banks Fishery was the poorest performing fishery with a BMT index score of 0.17. Data availability for the fishery is evidently lacking and stock assessments to support the management of the fishery are clearly. Therefore, currently, the fishery has no reference points for most indicators including target species. The fishery is fairly new; no management plans specific for the fishery, harvest control rules and/or evaluation and fishery reviews have been conducted. Most of the PIs could not scored due to lack of data and information, and similarly, the the performance of the fishery nor the sustainability could not be gauged.

Notwithstanding, some assesments were conducted under the dropline fishery trials under the KCDP project. The KEMFSED project should therefore initiate extensive stock assessments to determine the stock status and sustainability of the stocks, maintainance of the supporting ecosystems and habitats. Further, there is a need to establish a management strategy setting reference points for monitoring and evaluation of the fishery including stock rebuilding strategies where applicable for precautionary

purposes. A comprehensive RBF analysis is required for fishery in order to set clear reference points for target species stock assessments and evaluations, and determine whether or not the fishing operations are likely to maintain the secondary species above the biologically based limit and should support the recovery of any species below the biologically set limit. In the analysis, the impacts of the UoA on the recovery of ETP species inline with both national and international requirements for the protection of the ETP species.

4.6 BASKET TRAP FISHERIES

4.6.1 FISHERY DESCRIPTION AND CHARACTERIZATION

4.6.1.1 Management of the Basket Trap Fishery

The State Department for Fisheries, Aquaculture and the Blue Economy is the main management body while research is headed by the The Kenya Marine Fisheries Research Institute (KMFRI). At the local levels, County Fisheries Directorates with well structured BMUs and BMU Network to ensure coordinated approach to resource management. Stipulated responsibilities of BMUs include resolving user conflicts, field patrols, data collection, enumerating by-laws, control of illegal gears and methods, protection of breeding sites and maintenance of high fish quality standards. However, because of the extensive coastline and poor policing on the ground, there is a significant loss in data and statistics. There is also an Exporters Processing Zones Authority, the Fish Inspection and Quality Assurance (FIQA) which is within Kenya Fisheries Service and it is mandated to evaluate the fish quality control. NGOs, such as WWF have established programmes, particularly in Marine Protected Areas (MPAs) such as the Kiunga Marine Reserve that monitor and sample fish catches.

A recent study has raised concerns of the increasing fishing pressure on *S. sutor* along the Kenyan coast (Samoilys et al. 2011b). A policy brief was prepared for the Kenya government recommended that a species specific management plan for *S. sutor* should be developed and that spawning aggregations must be managed through protected areas (Samoilys et al. 2011c).

The lack of enforcement capacity within the SDFA&BE and the County Fisheries Directorates has limited the effectiveness of various interventions in management, especially the restrictions on the beine seine gear which has serious impacts on both the siganid species and other seagrass bed species, as well we the ecosystems and habitats.

4.6.1.2 Description of the fishery

Basket traps are one of the oldest forms of fishing gears known, and is globally used in both fresh- and mariner fisheries. In the marine fisheries of Kenya, the baskets traps are synonymous with the siganidae fisheries and are a very common gear in south coast

Kenya. McClanahan et al. (1997) noted that traps have relatively little selectivity, resulting in the capture of large numbers of small, low, or no-value fish (Mbaru & McClanahan 2013). They also cause low physical damage to corals (Mangi & Robers 2006; Cinner et al. 2009a).

The basket trap fisheries target high value fish species in numerous families including rabbitfish (Siganidae), goatfish (Mullidae), emperors (Lethrinidae), snappers (Lutjanidae) and groupers (Serranidae). They also catch other non-commercial but ecologically important herbivores such as surgeonfish (Acanthuridae), moorish idol (Zanclidae), parrotfish (Scaridae), and butterflyfish (Chaetodontidae). The siganids are important reef herbivores that browse individually or in schools over the reef or feed on plankton within the water column (Nelson, 1994; Wheeler, 1975). Hawkins & Roberts (2004) observed that within the shelf, the basket trap fisheries can result in serious over-fishing, reduce biodiversity, and alter ecosystem structure.

The fishery accounts for ≈ 180 Mt (11%) of the artisanal fishery landings. Two species; the shoemaker spinefoot *Siganus sutor* and the white-spotted spinefoot contribute the highest proportion by number of fish in catches pooled across gears used in the small-scale marine fisheries of the Kenyan coast. Over the last decade, the shoemaker spinefoot *S. sutor* contributes up to 44.8% of the basket trap fisheries catch (Samoilys et al. 2011b). Five other species are also recorded in the catch including *S. stellatus*, *S. rivulatus*, *S. luridus*, *S. canaliculatus*, and *S. argenteus*.

The siganids occur in coastal waters to a depth of at least 40 m. They are primarily herbivorous (Lam 1974) feeding on benthic algae and seagrass. The juveniles and adult fish mostly occupy shallow waters (McClanahan and Mangi, 2004; Mbaru & McClanahan, 2013). *Siganus sutor* are coral dwelling species and exhibit interspecific aggressive behavior. Along the Kenya coast, the *Siganus sutor* there two major spawning seasons: January/February and in May/June. *Siganus canaliculatus* inhabits inshore, algaal reefs, estuaries and in large lagoons with algae-rubble habitats but mainly common on rocky substrates (Kuitert et al., 2001). The species tolerates more turbid waters, occurring within the vicinity of river mouths especially around seagrass beds. Adults also occur several kilometers offshore in deep, clear waters. Juveniles form very large schools in shallow bays and coral reef flats; school size reduces with size, with adults occurring in groups of ≈ 20 individuals. Sexual maturity occurs over a wider size range (Lam, 1974) but attain maturity in <1-year. The species has a high fecundity ($\approx 300,000$ eggs /female). A detailed characterization of the fishery is shown in Table 22.

Table 22. Characterization of the Inshore Basket-Trap Fisheries

Fishers Scale & types	Small-scale, mainly inshore and creeks; very common fishing methods, e.g. ≈23% of fishers use basket traps in south coast Kenya (Government of Kenya, 2016); Fishing depth is between 5 to 30 meters. There's no existing semi-industrial/ industrial fisheries.
Primary target species	Lutjanidae (Snappers), Lethrinidae (Emperors), Siganidae (Rabbitfishes), Serranidae (Groupers), Acanthuridae (Surgeonfishes) Scaridae (Parrotfishes). Most abundant species; <i>Lethrinus lentjan</i> (7.6%), <i>Siganus sutor</i> (7.1%), <i>Lutjanus fulviflamma</i> (6.5%), <i>Leptoscarus vaigiensis</i> (5.5%), <i>Lethrinus borbonius</i> (5.3%) & <i>Lethrinus harak</i> (4.2%) (Mbaru & McClanahan, 2013) Mbaru & McClanahan estimate <i>Lethrinus lentjan</i> , <i>Siganus sutor</i> , <i>Leptoscarus vaigiensis</i> , <i>Lethrinus harak</i> & <i>Parupeneus macronemus</i> represents 75% of the catch (Mbaru & McClanahan, 2013, McClanahan et al, 2013)
Main Secondary species	Balistidae (Triggerfishes), Haemulidae (Grunts), Labridae (Wrasses), Mullidae (Goatfishes), Pomacanthidae (Angelfishes), Rajiidae (Skates)
Bycatch species	Chaetodontidae (Butterflyfishes); Monacanthidae (Filefishes); Monacanthidae (Filefishes); Pomacentridae (Damsel fishes); Ostraciidae (Trunkfishes); Diodontidae (Porcupinefishes); Triodontidae (Pufferfishes); Synanceiidae (Stonefishes); Tetraodontidae (Puffers); Muraenidae (moray eels), Acanthuridae (Surgeonfishes), Labridae (Wrasses), Zanclidae (Moorish idols), Priacanthidae (Bigeyes), Balistidae (Triggerfishes), Dasyathidae (Whiptail stingrays), Monacanthidae (Filefish) (Gomez, 2012) Main species in bycatch: <i>Chaetodon auriga</i> , <i>Chaetodon falcula</i> , <i>Chaetodon lineolatus</i> , <i>Chaetodon lunula</i> , <i>Chaetodon vagabundus</i> , <i>Diodon hystrix</i> , <i>Diodon liturosus</i> , <i>Platax teira</i> , <i>Sargocentron spp.</i> (e.g. <i>S. tieroides</i>), <i>Aluterus scriptus</i> , <i>Ostracion cubicus</i> , <i>Abudefduf sexfasciatus</i> , <i>Dascyllus trimaculatus</i> , <i>Pomacanthus chrysurus</i> , <i>Scorpaenopsis diabolus</i> , <i>Synanceia verrucosa</i> , <i>Arothron hispidus</i> , <i>Diodon holocanthus</i> , <i>Lagocephalus inermis</i> , <i>Acanthurus tennentii</i> , <i>Acanthurus nigrofuscus</i> , <i>Zanclus cornutus</i> , <i>Naso thynnoides</i> and <i>Naso brevirostris</i>). The only fish discarded was the puffer fish (family Tetraodontidae), which is considered poisonous
Fishing gears	Main gear: basket trap; widely used to target reef fish in coral reef lagoons, Other gears targeting Siganids include gillnets, beach seines, handlines & fence traps.
Fishing gear / Fishery interactions	Gear interactions: conflicts with spear-gun fishers, ring netters, aquarium fish divers removing catch from set traps; beach seines used in trap areas also interfere with operations of the traps; Handlines, basket traps, spearguns, reef seines & aquarium fishers
Fishing vessels	Dugout canoes, small plank boats & sailboats; propulsion: sails, paddles (kasia/kafi), pondo and a few use engines.
Fishing grounds	Basket traps are set in reefs, sea grass beds, inshore lagoons, i.e. continental shelf, shelf break, continental slope, intertidal etc (range nautical miles from shore if available)

Fishing seasons	All year round; NEM and SEM, though reduced frequency during SEM period with most traps brought ashore for repairs pending NEM calm season
Fishing operations	<p>Standard basket traps are weakly selective and retain most fish that enter, resulting in the capture & mortality of many non-targeted species (Munro, 1983). The traps are set at a depth of 8–14 meters during day-time low tide; Fishing depth 5.0-30 m. Consequently, high by-catch of juvenile fish and non-target species can reach >50% of the catch, even with relatively low fishing effort (Hardt, 2008).</p> <p>To date, bycatch remains a common impact of trap fisheries, hence the need to conduct further research on bycatch reduction (gated traps, variable mesh sizes on trap sides, different shapes of the traps, netting material etc., suspension depth)</p> <p>Traps are deployed in lagoons from canoes or small plank boats & anchored from the bottom by large stones, sometimes using dead corals to make them sink; Left overnight, captured fish are removed on next day. When removing the catch, the trap is raised; catch removed, bait replenished and then reset. Therefore, the fishing operations would have minimal impacts on the ecosystems and habitats.</p> <p>≈ 8% of the artisanal catch by abundance consists of species of value to the aquarium fishery; Cinner et al. (2009) estimates that <6% of artisanal fish catches by abundance constituted species that were strongly associated with corals, many of which are most likely targeted by aquarium fishers showing serious overlaps between the fisheries</p>
Geographic Extend of the fishery	Spatial expanse of the fishery from Frame Survey incl. data; Kwale (Vanga-Shimoni-Msambweni-Diani highest, Kilifi. Fishery covers the entire coastline, esp. in Kwale (excl. Tana delta) (Frame survey 2012). The catch is then sold locally at the landing sites to dealers and small scale fish traders; Entire coast, mostly south coast and north coast up to Mayungu.
Fishing Effort & level of Exploitation	<p>-Fishing mortality ($F_{CURR.}$) ≈ 1.8; Yields Y/R of 24.5% of FishB_0 and a SSB of 4.3% of the SSB$_0$</p> <p>-F_{MSY} is 0.9 (equivalent to ≈24.6% of fishable biomass FishB_0 & a spawning biomass of 14.2 % of the SSB$_0$) hence Siganid fishery is undergoing overfishing</p> <p>-Recommend: Keep SSB at a safe-level of above 20% of the SSB$_0$, lower fishing mortality to $F_{OPT}=0.7$ which yields a Y/R of 24.2% of the FishB_0; higher than current Y/R of 21% but at <50% the current fishing mortality $F_{CURR.}$; maintain spawning biomass at SSB$_{TARGET}= 4,910.5$ Mt, with SSB$_{LIMIT}= 3,928$ Mt and landed sizes at >18 cm</p> <p>-Several species, such as <i>Lethrinus lentjan</i>, was grossly over exploited, the second and third most common species, which represented about half of the catch were <i>Leptoscarus vaigiensis</i> and <i>Siganus sutor</i>, are also over exploited (Hicks and McClanahan, 2014)</p>
Catch per unit effort (CPUE)	CPUE: Recent field survey under the consultancy, 29 th Jan. to 3 rd Feb, 2019; CPUE = 5.54 kg/person/day, suggests decline in CPUE in the fisheries; Catch

	<p>rates- Lamu 39.25 ± 4.5 kg/vessel/day; Kilifi- 6.40 ± 1.9 kg/vessel/day; Mombasa- 8.81 ± 2.3 kg/vessel/day; Kwale- 9.41 ± 2.9 kg /vessel/day;</p> <p>Landings: Lamu 482,874kg/yr, Kilifi 446,339kg/yr; Mombasa 186,887kg/yr; Kwale 535,301kg/yr</p> <p>-Studies in the south coast found the basket traps to have a CPUE of between 2.0 ± 0.1 kg/fisher/trip (Tuda et al, 2016) and 5.5 ± 0.6 kg/fisher/trip between 2003/2004, 2008/2009 and 2014/2015 (mean \pm SE) from Gazi, Msambweni, Shimoni and Vanga) (Unpublished data, KMFRI)</p> <p>Fisher Issues: Reduced income for fishers, Overfishing? unsustainability in the fishery? Overexploitation due to increase in number of fishers and use of illegal fishing gears such as beach seines & monofilament gillnets are the main causes.</p> <p><i>Issues on ETPs:</i> there are no notable issues related to ETPs safe for some juveniles of some sharks, rays and skates</p> <p>Issues on ecosystem/habitats: use of corals to anchor the traps, damage to corals, fishers dropping traps on the coral reefs; Acanthurids feed on algae</p> <p>-Increased algae and low coral cover dominance; Reduce diversity, ecological redundancy and associated interactions; Reduced ecological redundancy and tourist attraction</p>
Biological data	<p>Siganids attain sexual maturity <1 yr old for most species; <i>Siganus sutor</i> $L_{\infty} = 36.2$ cm SL & K of 0.87 on an annual basis. Independently, a curve was fitted by eye to the same data, and values were read off the curve and used in a standard Ford–Walford plot. This gave an L_x of 35 cm and a K of 0.9. The close agreement of the values obtained by the two methods, and of these with values in the literature, demonstrates the value of using microbands for determining growth parameters in a tropical fish. <i>Siganus canaliculatus</i>, the second most common species in the Kenya coast matures earlier than the other species. Previous studies show that it matures earlier in captivity than in the wild and that males mature earlier than females. The maturation size is 10.6 cm standard length (SL) for males and 11.6 cm SL for females. The mean lengths of the <i>Siganus sutor</i> and <i>Leptoscarus vaigiensis</i> captured in the basket traps in the South coast of Kenya were 24.2 cm and 16.4 cm respectively. Moreover, the sizes were below the size at first maturity L_m of those species (Tuda et al, 2016. Larval stages are pelagic and common in waters beyond the outer reef, but do not wander as far offshore as do larvae of migratory coastal species with pelagic eggs.</p>
Stock assessment data	<p>-Annual catch 1651Mt; SSB_{MSY} 2,227 Mt 11.9%; $SSB_{CURRENT}$ 825 t (4.2%); SSB_0 1000Mt; F_{MSY} 1.1; Fishing mortality 1.86; Maturity L_{50} 28.2 cm; Size ranges 1.5 to 45 cm; BW 9g-750g; Total mortality $Z \approx 2.75$ (Wambiji et al, 2018). According to the respondents' views, the sizes of fish landed in the Siganid fishery has really declined in the last five years. This is mainly due to the use of small meshed nets that is not selective, it captures both the juveniles and adult fishes, and some even use mosquito nets.</p> <p>Overall CPUE of Siganid fishery in the marine fishery of Kenya is estimated at 5.54 Kg/person/day with Mombasa and Kwale Counties is estimated at</p>

	<p>5.03 and North Coast (Kilifi, Tana River and Lamu) estimated at 4.90. This is clear that in the North coast the fishing grounds (coral reefs and sea grass beds) are being destroyed on a higher rate compared to Mombasa and South coast due to the wide use of beach seines within the lagoons. On the other hand, the fish price has increased entirely along the coastline, this is mainly due to the low supply of fish.</p> <p>Assessments on most of the other species are limited safe for monitoring by Wildlife Conservation Society; e.g. Hicks and McClanahan, 2014 estimated that 15 species represented over 90% of the catch, with only three species accounting for 60% of the catch; <i>Lethrinus lentjan</i> (Lacepe`de), <i>Siganus sutor</i> (Valenciennes) and <i>Leptoscarus vaigiensis</i> (Quoy & Gaimard) all showed evidence of growth overfishing. <i>Lethrinus lentjan</i> (exploitation rate ≈ 0.82), also shows evidence of recruitment overfishing; The three species combined make up 63% by abundance and 75% by weight of the 15 most abundant species.</p> <p>- Across all gears, over 90% of landed <i>L. lentjan</i> are below L_{mat}, with 99.6% of those landed by beach seine under L_{mat}. Over 50% of landed <i>S. sutor</i> were below L_{mat} across all gears & over 90% of individuals landed by beach seine & spears are below L_{mat}.</p> <p>-Total mortality estimates $Z \approx 5.26, 3.15, \text{ and } 3.24$ for <i>L. lentjan, S. sutor</i> & <i>L. vaigiensis</i> equating to F estimates of 4.29, 1.66, and 2.26, respectively; This indicates that effectively, all the <i>L. lentjan, S. sutor</i> and <i>L. vaigiensis</i> individuals present in the lagoon in a year, 98%, 81%, and 89% respectively were removed by fishing</p>
<p>Management / Legislation / Governance</p>	<p>There is no specific management plan for inshore/basket trap fishery that is mandated for enforcement capacity necessary to mitigate the decline in fish catches caused by overfishing and use of destructive gears.</p> <p>Incl. co-mgt, BMUs, general licensing regulations; control of specific gears e.g. scuba, beach seine ban, etc.</p> <p>The Fisheries Department is the national institution mandated to manage the fisheries sector and operates under the Ministry of Livestock & Fisheries Development.</p> <p>Current legal but weakly enforced gear restrictions are capable of protecting a significant portion of the catch up to maturity but optimization of yield will require that the current mesh size be increased from 6.3 to 8.8 and 9.2 cm to increase yields of <i>L. lentjan</i> and <i>S. sutor</i>, respectively. Given the difficulties of enforcing mesh size, we recommend that the economic benefits of these larger mesh sizes be communicated and enforced through co-management.</p> <p>Monitoring of the fishery is carried out by Wildlife Conservation Society, Kenya Marine and Fisheries Research Institute and State Department of Fisheries to promote modification of the basket trap by adding an escape gap which helps reduce by-catch by allowing juveniles and small-sized fish to swim out of the trap.</p>

	The catch of the three most abundant species landed indicates that the mesh size used in the fishery is ,5 cm, compared to a legal minimum mesh size of 6.35 cm (Table 5). L50% was 10.9 cm, 11.3 cm, and 13.6 cm for <i>L. lentjan</i> , <i>S. sutor</i> and <i>L. vaigiensis</i> , respectively. If managers wanted to increase protection of the three most abundant species in the catch to ensure L50% was above Lmat, mesh regulations would have to be increased to 8.8 cm and 9.2 cm for <i>L. lentjan</i> & <i>S. sutor</i> , respectively and enforced at 6.3 cm for <i>L. vaigiensis</i> . Mesh would have to be increased to 10.0 cm and 10.5 cm and 9.2 cm for <i>L. lentjan</i> , <i>S. sutor</i> , and <i>L. vaigiensis</i> respectively
Data & MCS	Data collection is fairly good but not well streamlined for the entire coast; a need to enhance monitoring for the fisheries, and especially assessment of the catches of the target species in other gears/fisheries

External Factors Affecting the Stock

Fish stocks vary naturally as a result of the effects of the environment; even in the absence of fishing and the recruitment of *S. sutor* and *S. canaliculatus* is influenced by rainfall, ocean currents, changes in climate, disease etc. which affect spawning, recruitment and growth, resulting in environmentally-driven changes in abundance. The stocks are also affected by the over-exploitation above the management regime. Seasons, e.g. monsoons have significant effects on the fishing effort level. Rough seas reduce the effort inhibiting exploitation. Habitat changes also affects the population growth rate by impacting on individual growth, survival of individuals at various life-stages, or spawning production per individual. For instance, the presence of mangroves near to coral reefs can enhance the biomass of fisheries species that live on coral reefs as adults, because juveniles use mangrove habitat (Mumby et al. 2004).

4.6.2 BASKET TRAP FISHERY PRE-ASSESSMENT RESULTS

4.6.2.1 Principle 1: Sustainability of the Exploited Stocks

Using biological reference points; $F_{MSY}/F_{CURR} = 0.5$ and $E_{MSY}/E_{CURR} = 0.38$, the fishing pressure is considered to be very high. However, there are no stock rebuilding and harvest strategies to reduce the exploitation rate. Furthermore, the SSB_{CURR} of 825.5 Mt is far below the virgin SSB_0 of 1000Mt. Using $SSB_{CURR} < SSB_0$ as proxy, the SSB_{CURR}/SSB_0 of 0.826 (82.6% of SSB_0) indicates that the stocks are at sustainable levels. However, the current fishing effort level and fishing operations are likely to impair recruitment. The stock status is fluctuating at/or around a level consistent with MSY (SSB_{MSY} : 2,227 Mt.). The $SSB_{CURR}/SSB_{MSY} = 0.37$ (i.e. SSB_{CURR} is 37% of SSB_{MSY}) indicates that the stocks are below the MSY biomass reference limit but still within the 20% limit to suggest onset of over-fishing. However, there are high risks for over-exploitation due to the multi-gear nature of the siganid fisheries and the wider small-scale marine fisheries in Kenya.

Data and information from stock assessments is fairly available to support the harvest strategies and define harvest control rules (HCRs). Where data lacks, assumptions & relative estimates have been calculated e.g. age data from length-at-age estimates, using Length-at-age data from other fisheries. The assessments have not been tested rigorously but undergone internal peer-review.

Table 23. Basket Trap Fishery Summary Conservative scores for Principle 1 PIs

P1	Outcome	1.1.1	Stock status	<60
		1.1.2	Stock rebuilding	<60
	Management	1.2.1	Harvest strategy	<60
		1.2.2	Harvest control rules & tools	<60
		1.2.3	Information & monitoring	60-79
		1.2.4	Assessment of stock status	>80

4.6.2.2 Principle 2: Maintenance of the Fishery Ecosystem and Habitats

Based on the general fishery information and available landing statistics, the main secondary species: *Lethrinus spp.*, *Balistidae spp.*, *Haemulids spp.*, *Labrids etc.* are likely to be within the biologically based limits. Furthermore, there are measures in place (MPAs, CCA, CMAs, Conservancy etc.), that are expected to ensure that the UoAs do not impact stocks to levels which are likely to impair recruitment. There are no existing management strategies specific to the secondary species, however, there is a review of the potential effectiveness and practicality of alternative measures to minimize UoA-related mortality of unwanted catch of main secondary species and capture of juveniles & low value species using gated traps, bigger mesh sizes etc.

There is adequate data and information to support partial strategies to enable establishment of some degree of management for the fishery. The impacts of the UoAs on the ecosystem have been documented in various studies and can be inferred from other studies and the fishing operations are unlikely to adversely impact the ecosystem's functioning and productivity. However, use of the fishing gears on corals might cause serious harm/irreversible alterations hence MCS on gears with interacting ecosystems should be closely enhanced. Additionally, the use of seagrass as bait also degrades the ecosystems. Although there are no management strategies specific to the exploited ecosystems, general fishery legislations are in place to limit impacts on ecosystem function, structure and productivity.

Table 24. Basket Trap Fishery Summary Conservative scores for Principle 2 PIs

P2	Primary species	2.1.1	Outcome	<60
		2.1.2	Management strategy	<60
		2.1.3	Information/Monitoring	60-79
	Secondary species	2.2.1	Outcome	60-79
		2.2.2	Management strategy	<60
		2.2.3	Information/Monitoring	60-79
	ETP species	2.3.1	Outcome	≥80
		2.3.2	Management strategy	----
		2.3.3	Information strategy	60-79
	Habitats	2.4.1	Outcome	60-79
		2.4.2	Management strategy	60-79
		2.4.3	Information	>80
	Ecosystem	2.5.1	Outcome	>80
		2.5.2	Management	60-79
		2.5.3	Information	>80

4.6.2.3 Principle 3: Effective and Responsible Management of the Fishery

There is an effective general legal and customary framework for management of the fishery e.g. BMU regulations give legal rights to resource-users for co-management of the resources. However, some flaws exist in the implementation of this system. Consultation structures are also in place to inform the management system although there are no clear schedules and time-frames for the consultations. The areas of responsibility and interaction are well defined but there is overlap in the institutional frameworks. The management policy has clear long-term objectives to guide decision-making that are consistent with MSC Principles and Criteria, and incorporates the precautionary approach at no less standards than defined in international agreements. However, there are no existing fishery specific management plans.

General monitoring, Control and Surveillance (MCS) mechanisms are in place and implementation is fairly effective. However, there is need to strengthen the enforcement of sanctions and implementation of a comprehensive MCS system to monitor the compliance levels. Mechanisms to evaluate the system are clearly lacking and numerous aspects of the MCS such as by-catch, catch-effort and conflict resolution with other fisheries require immediate attention. Some assessments on research and conflict resolution have been conducted but more research should focus on basket trap mesh-sizes, designs of escape gaps etc. to enhance sustainability of the fishery.

Table 25. Basket Trap Fishery Summary Conservative scores for Principle 3 PIs

P3	Governance & policy.	3.1.1	Legal &/or customary framework	>80
		3.1.2	Consultation, roles & responsibilities	60-79
		3.1.3	Long term objectives	>80
	Fishery specific management system	3.2.1	Fishery specific objectives	<60
		3.2.2	Decision making processes	60-79
		3.2.3	Compliance & enforcement	60-79
		3.2.4	Monitoring & Management	<60

4.6.3 BASKET TRAP FISHERY BMT TOOL ANALYSIS RESULTS

Pre-assessment for Basket trap fishery result show that only seven (7) Pis scored ≥ 80 ; PI 1.2.4 Assessment of stock status, PI 2.3.1 ETP Species outcome, PI 2.4.3 Habitats Management, PI 2.5.1 – Ecosystem outcome, PI 2.5.3 – Ecosystem information, PI 3.1.1 – Legal and/or customary framework, PI 3.1.3 – Long term objectives, while nine (9) Pis scored <60 and 11 Pis scored 60-79. The detailed assessment results are shown in appendix 13.

The overall BMT score for the Basket trap fisheries *T. albacares* fishery is 0.46, an indication of a fishery with non-conformity to sustainability outcomes and increased uncertainty about its long-term sustainability. The score for Principle 1 is 0.25; P2=0.54 & P3=0.50 indicating fairly performance for the sustainability of the fishery stocks while the maintainance of the ecosystems and habitats supporting the fisheries, as well as governance and policy also performed dismally. The design of FiPs under the KEMFSED Project should therefore put more emphasis, first and foremost on assesement of the stock status, defining a clear harvest strategy, HCRs and tools, stock rebuilding of overfished species stocks, and primary species outcome and management in order to steer the fisheries to sustainability. The results of the fishery BMT analysis results are shown in Figure 16 while the projected benchmarking for the fishery over the five (5) year period (2019-2023) is shown in Figure 17. The full MSC's BMT tool baseline results and 5-year projections for *T. albacares* tuna fishery are shown in Appendix 14.

		Unit of Assessment		
Fishery Name:	BASKET TRAP FISHERIES	Species	Area	Gear type
FIP provider:	KEMFSED PROJECT	<i>Siganus sutor</i>	ALL Coast	Basket trap
Pre-assessment undertaken by:	DR. BERNERD M. FULANDA	<i>S. canaliculatus</i>		
Action plan undertaken by:				
BMT undertaken by:	DR. FULANDA / KEMFSED TEAM			
Date of BMT:	12TH MARCH, 2019			

Actual BMT index summary table

Last update: Year 1

Scoring Level	All PIs	Principle 1 Number of PIs	Principle 2 Number of PIs	Principle 3 Number of PIs
≥80	7	1	4	2
60-79	11	1	7	3
<60	9	4	3	2
BMT Index	0.46	0.25	0.54	0.50

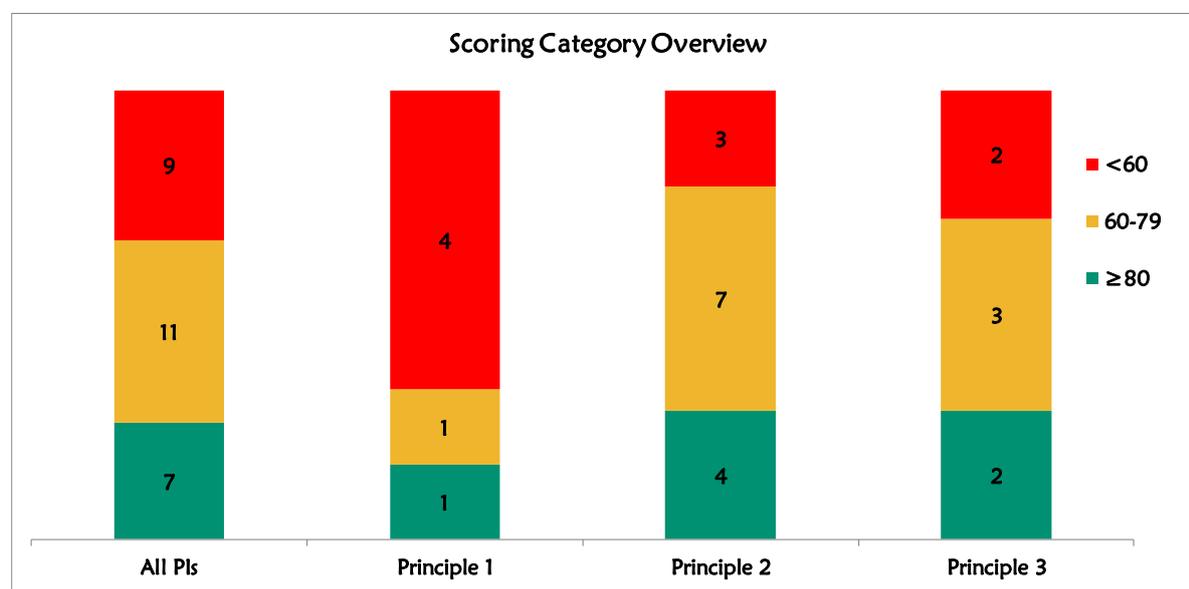


Figure 16. MSC’s BMT Tool Results for Sustainability of the Kenya Marine Basket Trap Fishery

Actual vs. Expected BMT index table

		BMT Index				
		Year 1	Year 2	Year 3	Year 4	Year 5
Principle 1	Actual	0.25				
	Expected		0.25	0.42	0.50	0.75
Principle 2	Actual	0.54				
	Expected		0.54	0.54	0.82	0.89
Principle 3	Actual	0.50				
	Expected		0.50	0.50	0.64	0.79
Overall	Actual	0.46				
	Expected		0.46	0.50	0.70	0.83

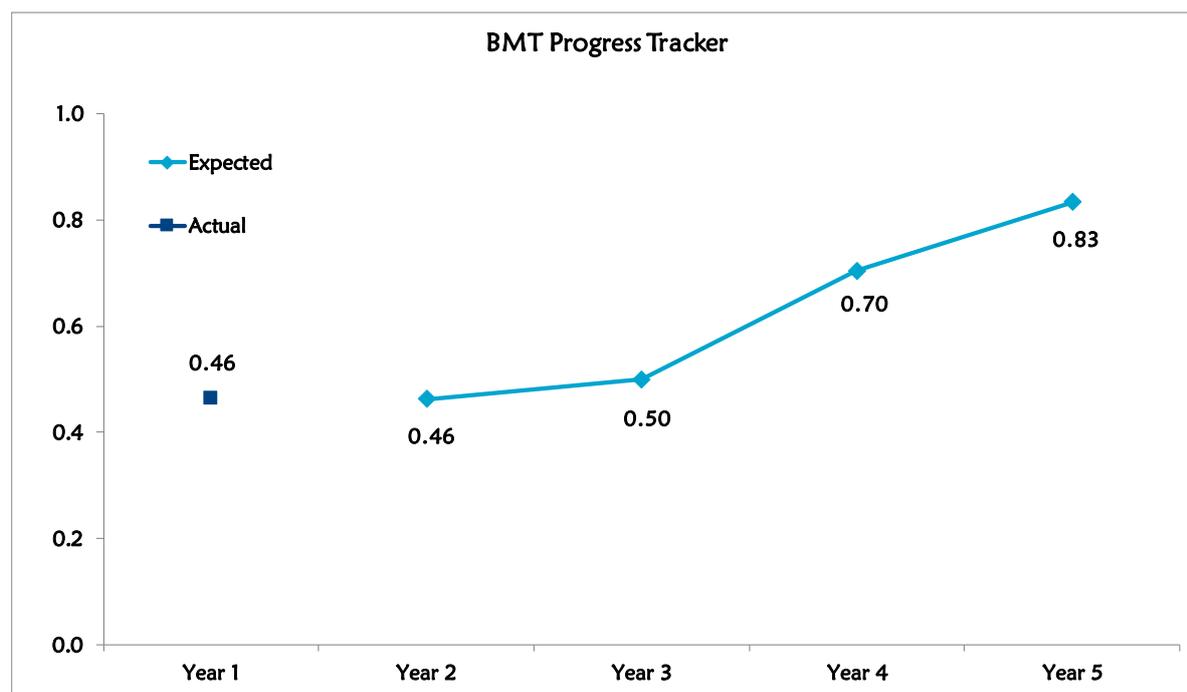


Figure 17. MSC’s BMT Tool Forecast for Improvement of the Kenya Marine Basket Trap Fishery

4.6.4 CONCLUSIONS AND RECCOMENDATIONS

The Basket trap is one of the most studied marine fisheries along the Kenya coast. Therefore, though comprehensive stock assessments have not be conducted for the fishery, detailed data and information is available for the same fairly enough to manage the fishery. Recent studies suggest that target species are at a risk of over-exploitation owing to the multi-gear nature of the Siganid fishery; the gears range from basket traps, beach seines, spears and guns etc., an approach that is likely to likely to impair recruitment. Due to the nature of the fishery, it was not possible to isolate/designate the primary species and the fishery lacks specific management strategies though the general strategies employed for the small-scale fisheries would not clearly address the issues in this fishery. Therefore, a RBF analysis of the secondary species should determine

the impacts of the UOA on the secondary species (with reference to the biological aspects), and the recovery of any impacted species. The FiPs should enact a specific management strategy for the fishery should be put in place and monitored regularly especially with regards to regulation of the multi-gears in the fishery. Further, comprehensive assessment of basket trap mesh sizes and designs of the escape gaps with a focus to establish optimal gear designs for the fishery. Lastly, the need for investment in value addition at the BMU level and provision of infrastructural support to enhance fishery sustainability.

5 ACKNOWLEDGEMENTS

The Consultant is grateful for the support in terms of data and information provided by the State Department of Fisheries, Aquaculture & the Blue Economy; the Kenya Fisheries Service (KeFS) at the National and Regional level; the County Directorates of fisheries in Kwale, Mombasa, Kilifi and Lamu; the Kenya Marine and Fisheries Research Institute Mombasa, the the BMU Networks and teams on the ground and the fishers in the coastal and marine fisheries of Kenya, from Vanga to Kiunga in the north.

Special regards go Ms. Susan Imende - the Director general KeFS, and Ms. Betty Nyandat and Ms. Rose Koboge - the Project coordination at the national level, Ms. Mwaka Barabara, the Director of Fisheries, Marine; the Consultancy supervisors – Mr. Kennedy Shikami of KeFS and Dr. Gladys Okemwa of KMFRI; the technical team that were involved in the Benchmark analysis; Ms. Elizabeth Mulwa KeFS, Dr. Gladys Okemwa KMFRI, Dr. Nina Wambiji KMFRI, Mr. Dishon Murage SEACOLOGY, Mr. Kennedy Shikami KeFS and Mr. Johnstone Omukoto KMFRI. Lastly, the Consultancy would be very grateful to the world bank team, led by Dave Japp for the guidance provided on the selection of the Priority species, MSC analysis and the magnitude of the current assignment, and the continuous inputs during reporting and review of the draft final report; to all of the team involved, your contributions will go along way in ensuring the success of the FiPs under the KEMFSED project – Thankyou.

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7 APPENDICES

Appendix 1: MSC Pre-assessment Results for the Small Purse-Seine Fishery

Principle 1: Sustainability of exploited fish stocks

Evaluation Table for PI 1.1.1 – Stock status

PI 1.1.1	The stock is at a level which maintains high productivity and has a low probability of recruitment overfishing		
Scoring Issue	SG 60	SG 80	SG 100
a	Stock status relative to recruitment impairment		
Guidepost	It is likely that the stock is above the point where recruitment would be impaired (PRI).	It is highly likely that the stock is above the PRI.	There is a high degree of certainty that the stock is above the PRI.
Met?	YES, stock assessments on small & medium pelagics (ring nets & reef seines) suggest low biomass levels for target species; SSB_{CURR}/SSB_0 of 0.137 for <i>S. flavicauda</i> & 0.072 for <i>R. kanarguta</i> ; and 0.036 for <i>S. jello</i> & 0.018 for <i>S. obtusata</i> (primary major species)	(Y/N)	(Y/N)
b	Stock status in relation to achievement of MSY		
Guidepost		The stock is at or fluctuating around a level consistent with MSY.	There is a high degree of certainty that the stock has been fluctuating around a level consistent with MSY or has been above this level over recent years.
Met?		YES, stock assessments on small & medium pelagics (ring nets & reef seines) suggest overfishing within the nearshore waters F_{CURR}/F_{MSY} ranging between 1.3-2.4 for target species and 2.0-3.9 for the primary major species	(Y/N)
Overall PI justification	<p>-YES, stock assessments on small & medium pelagics (ring nets & reef seines) suggest low biomass levels for target species; SSB_{CURR}/SSB_0 of 0.137 for <i>S. flavicauda</i> & 0.072 for <i>R. kanarguta</i>; and 0.036 for <i>S. jello</i> & 0.018 for <i>S. obtusata</i> (primary major species)</p> <p>-YES, stock assessments on small & medium pelagics (ring nets & reef seines) suggest overfishing within the nearshore waters F_{CURR}/F_{MSY} ranging between 1.3-2.4 for target species and 2.0-3.9 for the primary major species</p>		
References	Munga et al, KCDP report; Fact sheets		

PI 1.1.1	The stock is at a level which maintains high productivity and has a low probability of recruitment overfishing		
Scoring Issue	SG 60	SG 80	SG 100
RBF Required? (✓/✗/)	Not required	Likely PI Scoring Level (<60, 60-79, ≥ 80)	60-79
Stock Status relative to Reference Points			
	Type of reference point	Value of reference point	Current stock status relative to reference point
Reference point used in scoring stock relative to PRI (SIa)	SSB _{CURR} , SSB ₀ , SSB _{MSY}	SSB _{MSY} /SSB ₀ : <i>S. flavicauda</i> 0.211 <i>R. kanarguta</i> ; 0.271 <i>S. jello</i> : 0.133 <i>S. obtusata</i> : 0.230	SSB _{CURR} /SSB ₀ <i>S. flavicauda</i> 0.137 <i>R. kanarguta</i> ; 0.072 <i>S. jello</i> : 0.036 <i>S. obtusata</i> : 0.018
Reference point used in scoring stock relative to MSY (SIb)	F _{CURR} , F _{MSY}	<i>S. flavicauda</i> ; F _{CURR} : 0.8, F _{MSY} : 0.6 <i>R. kanarguta</i> ; F _{CURR} : 1.2, F _{MSY} : 0.5 <i>S. jello</i> ; F _{CURR} : 2.1, F _{MSY} : 1.1 <i>S. obtusata</i> ; F _{CURR} : 2.8, F _{MSY} : 0.8	<i>S. flavicauda</i> ; F _{CURR} /F _{MSY} : 1.33 <i>R. kanarguta</i> ; F _{CURR} /F _{MSY} : 2.4 <i>S. jello</i> ; F _{CURR} /F _{MSY} : 1.99 <i>S. obtusata</i> ; F _{CURR} /F _{MSY} : 3.5

Evaluation Table for PI 1.1.1A - key LTL [NOTE: only use this table for stocks identified as key LTL]

PI 1.1.1 A	The stock is at a level which has a low probability of serious ecosystem impacts		
Scoring Issue	SG 60	SG 80	SG 100
a	Stock status relative to ecosystem impairment		
Guidepost	It is likely that the stock is above the point where serious ecosystem impacts could occur.	It is highly likely that the stock is above the point where serious ecosystem impacts could occur.	There is a high degree of certainty that the stock is above the point where serious ecosystem impacts could occur.
Met?	(Y/N)	(Y/N)	(Y/N)
b	Stock status in relation to ecosystem needs		
Guidepost		The stock is at or fluctuating around a level consistent with ecosystem needs.	There is a high degree of certainty that the stock has been fluctuating around a level consistent with ecosystem needs or has been above this level over recent years.
Met?		(Y/N)	(Y/N)
Overall PI justification	N/A		
References	N/A		
RBF Required? (✓/✗/)	X	Likely PI Scoring Level (<60, 60-79, ≥ 80)	NO SCORE
Stock Status relative to Reference Points			
	Type of reference point	Value of reference point	Current stock status relative to reference point
Reference point used in scoring stock relative to	[e.g. B _{35%}]	[Include value specifying units.	[Include current stock status in the same units as the

PI 1.1.1 A		The stock is at a level which has a low probability of serious ecosystem impacts		
Scoring Issue		SG 60	SG 80	SG 100
a	Stock status relative to ecosystem impairment			
	Guidepost	It is likely that the stock is above the point where serious ecosystem impacts could occur.	It is highly likely that the stock is above the point where serious ecosystem impacts could occur.	There is a high degree of certainty that the stock is above the point where serious ecosystem impacts could occur.
	Met?	(Y/N)	(Y/N)	(Y/N)
b	Stock status in relation to ecosystem needs			
	Guidepost		The stock is at or fluctuating around a level consistent with ecosystem needs.	There is a high degree of certainty that the stock has been fluctuating around a level consistent with ecosystem needs or has been above this level over recent years.
	Met?		(Y/N)	(Y/N)
Overall PI justification		N/A		
References		N/A		
ecosystem impairment (SIa)			e.g. 50,000t total stock biomass]	reference point e.g. 90,000/B _{35%} =1.8]
Reference point used in scoring stock relative to ecosystem needs (SIb)		[e.g. B _{75%}]	[Include value specifying units. e.g. 100,000t total stock biomass]	[Include current stock status in the same units as the reference point e.g. 90,000/B _{75%} =0.9]

Evaluation Table for PI 1.1.2 – Stock rebuilding

PI 1.1.2		Where the stock is reduced, there is evidence of stock rebuilding within a specified timeframe		
Scoring Issue		SG 60	SG 80	SG 100
a	Rebuilding timeframes			
	Guidepost	A rebuilding timeframe is specified for the stock that is the shorter of 20 years or 2 times its generation time . For cases where 2 generations is less than 5 years, the rebuilding timeframe is up to 5 years.		The shortest practicable rebuilding timeframe is specified which does not exceed one generation time for the stock.
	Met?	None, no plans in place		(Y/N)
b	Rebuilding evaluation			

PI 1.1.2		Where the stock is reduced, there is evidence of stock rebuilding within a specified timeframe		
	Guidepost	Monitoring is in place to determine whether the rebuilding strategies are effective in rebuilding the stock within the specified timeframe.	There is evidence that the rebuilding strategies are rebuilding stocks, or it is likely based on simulation modelling, exploitation rates or previous performance that they will be able to rebuild the stock within the specified timeframe.	There is strong evidence that the rebuilding strategies are rebuilding stocks, or it is highly likely based on simulation modelling, exploitation rates or previous performance that they will be able to rebuild the stock within the specified timeframe.
	Met?	No	(Y/N)	(Y/N)
Overall PI justification		No stock rebuilding set for the fishery since the target species <i>S. flavicauda</i> ; F_{CURR}/F_{MSY} effort is around the MSY; however, the overfished status of the other species in the fishery calls for set stock rebuilding, with timeframes to achieve the same. Need to establish stock rebuilding plans for the recovery of the fishery <i>S. flavicauda</i> : stock status below limit SSB (-11.3%); below SSB_{MSY} (-7.4%) <i>R. kanarguta</i> : stock status below limit SSB (-17.8%); below SSB_{MSY} (-19.9%)		
References		Frame survey reports		
				Likely PI Scoring Level (<60, 60-79, ≥ 80) <60

Evaluation Table for PI 1.2.1 – Harvest strategy

PI 1.2.1		There is a robust and precautionary harvest strategy in place		
Scoring Issue		SG 60	SG 80	SG 100
a	Harvest strategy design			
	Guidepost	The harvest strategy is expected to achieve stock management objectives reflected in PI 1.1.1 SG80.	The harvest strategy is responsive to the state of the stock and the elements of the harvest strategy work together towards achieving stock management objectives reflected in PI 1.1.1 SG80.	The harvest strategy is responsive to the state of the stock and is designed to achieve stock management objectives reflected in PI 1.1.1 SG80.
	Met?	YES, there is regulations set in the Small-scale purse seine net fishery management plan; zoning/spatial limits, mesh size, net size and depth, fishing durations (day ban), closed season, licenses etc.	(Y/N)	(Y/N)
b	Harvest strategy evaluation			
	Guidepost	The harvest strategy is likely to work based on prior experience or plausible argument.	The harvest strategy may not have been fully tested but evidence exists that it is achieving its objectives.	The performance of the harvest strategy has been fully evaluated and evidence exists to show that it is achieving its objectives including being clearly able to maintain stocks at target levels.

PI 1.2.1	There is a robust and precautionary harvest strategy in place		
	Met?	YES, based on landings, and case studies from elsewhere, the strategy is likely to work (ref studies from literature)	(Y/N)
c	Harvest strategy monitoring		
	Guidepost	Monitoring is in place that is expected to determine whether the harvest strategy is working.	
	Met?	YES, routine monitoring of the fishery by SDF&BE & County directorates of fisheries with clear licensing plans, reporting structures for the migrant fishers etc	
d	Harvest strategy review		
	Guidepost		The harvest strategy is periodically reviewed and improved as necessary.
	Met?		YES, the strategies has been reviewed and improved at various levels: e.g. reporting to BMUs, licensing structures, County levels changes including work permits, closure of coasts to ring nets etc.
e	Shark finning		
	Guidepost	It is likely that shark finning is not taking place.	It is highly likely that shark finning is not taking place.
	Met?	Not relevant	(Not relevant)
			There is a high degree of certainty that shark finning is not taking place.
f	Review of alternative measures		
	Guidepost	There has been a review of the potential effectiveness and practicality of alternative measures to minimize UoA-related mortality of unwanted catch of the target stock.	There is a regular review of the potential effectiveness and practicality of alternative measures to minimize UoA-related mortality of unwanted catch of the target stock and they are implemented as appropriate.
	Met?	Not relevant	(Y/N/Not relevant)
			There is a biennial review of the potential effectiveness and practicality of alternative measures to minimize UoA-related mortality of unwanted catch of the target stock, and they are implemented, as appropriate.
Overall PI justification	There are regulations set in the Small-scale purse seine net fishery management plan; zoning/spatial limits, mesh size, net size and depth, fishing durations (day ban), closed season, licenses etc. Based on landings, and case studies from elsewhere, the strategy is likely to work (ref studies from literature)		

PI 1.2.1	There is a robust and precautionary harvest strategy in place		
	Routine monitoring of the fishery by SDF&BE & County directorates of fisheries with clear licensing plans, reporting structures for the migrant fishers etc The strategies has been reviewed and improved at various levels: e.g. reporting to BMUs, licensing structures, County levels changes including work permits, closure of coasts to ring nets etc. No shark finning in ring nets fisheries; expert opinion, MSC		
References	Christensen 1997;Butterworth,Cochrane and De Oliveira 1997;Okechi and Polovina 1994		
	Likely PI Scoring Level (<60, 60-79, ≥ 80)	<60	

Evaluation Table for PI 1.2.2 – Harvest control rules and tools

PI 1.2.2	There are well defined and effective harvest control rules (HCRs) in place			
Scoring Issue	SG 60	SG 80	SG 100	
a	HCRs design and application			
Guidepost	Generally understood HCRs are in place or available that is expected to reduce the exploitation rate as the point of recruitment impairment (PRI) is approached.	Well defined HCRs are in place that ensure that the exploitation rate is reduced as the PRI is approached, are expected to keep the stock fluctuating around a target level consistent with (or above) MSY, or for key LTL species a level consistent with ecosystem needs.	The HCRs are expected to keep the stock fluctuating at or above a target level consistent with MSY, or another more appropriate level taking into account the ecological role of the stock, most of the time.	
Met?	YES, ring net management draft plan is available, not gazetted, and lacks limit reference points and required trigger for any action to be taken in controlling the exploitation rates	(Y/N)		
b	HCRs robustness to uncertainty			
Guidepost		The HCRs are likely to be robust to the main uncertainties.	The HCRs take account of a wide range of uncertainties including the ecological role of the stock, and there is evidence that the HCRs are robust to the main uncertainties.	
Met?		NO, there are no designed HCRs in place	(Y/N)	
c	HCRs evaluation			
Guide post	There is some evidence that tools used or available to implement HCRs are appropriate and effective in controlling exploitation.	Available evidence indicates that the tools in use are appropriate and effective in achieving the exploitation levels required under the HCRs.	Evidence clearly shows that the tools in use are effective in achieving the exploitation levels required under the HCRs.	

PI 1.2.2		There are well defined and effective harvest control rules (HCRs) in place		
	Met?	YES, gear restrictions, licensing, onboard observers, catch-effort monitoring, no fishing in MPAs, CCAs, near FADs etc.	(Y/N)	(Y/N)
Overall PI justification		There are regulations set in the Small-scale purse seine net fishery management plan; zoning/spatial limits, mesh size, net size and depth, fishing durations (day ban), closed season, licenses etc. There are no regulations designed HCRs in place Evidence of tools for HCRs include; gear restrictions, licensing, onboard observers, catch-effort monitoring, no fishing in MPAs, CCAs, near FADs etc.		
References		Bromhead et al., 2003; Church and Obura, 2005		
			Likely PI Scoring Level (<60, 60-79, ≥ 80)	<60

Evaluation Table for PI 1.2.3 – Information and monitoring

PI 1.2.3		Relevant information is collected to support the harvest strategy		
Scoring Issue		SG 60	SG 80	SG 100
a	Range of information			
	Guidepost	Some relevant information related to stock structure, stock productivity and fleet composition is available to support the harvest strategy.	Sufficient relevant information related to stock structure, stock productivity, fleet composition and other data is available to support the harvest strategy.	A comprehensive range of information (on stock structure, stock productivity, fleet composition, stock abundance, UoA removals and other information such as environmental information), including some that may not be directly related to the current harvest strategy, is available.
	Met?	YES, Catch-effort (catch & fleet size) monitoring, participatory mapping, development of a draft plan, some data on stock assessments available	(Y/N)	(Y/N)
b	Monitoring			
	Guidepost	Stock abundance and UoA removals are monitored and at least one indicator is available and monitored with sufficient frequency to support the harvest control rule.	Stock abundance and UoA removals are regularly monitored at a level of accuracy and coverage consistent with the harvest control rule , and one or more indicators are available and monitored with sufficient frequency to support the harvest control rule.	All information required by the harvest control rule is monitored with high frequency and a high degree of certainty, and there is a good understanding of inherent uncertainties in the information [data] and the robustness of assessment and

PI 1.2.3		Relevant information is collected to support the harvest strategy		
				management to this uncertainty.
	Met?	YES, some catch-effort data collected, fishery monitoring done, GPS tracking etc. but not based on set HCRs	(Y/N)	(Y/N)
c	Comprehensiveness of information			
	Guidepost		There is good information on all other fishery removals from the stock.	
	Met?		YES, generally data on removals of the ring net fishery species from other fishery types is available and can comprehensively be collated with some additional monitoring efforts	
Overall PI justification	Catch-effort (catch & fleet size) monitoring, participatory mapping, development of a draft plan, some data on stock assessments available to support harvest strategy Some catch-effort data collected, fishery monitoring done, GPS tracking etc. for stock abundance and UOA's removals' monitoring but not based on set HCRs			
References	Frame survey reports; CAS data from SDF&BE			
			Likely PI Scoring Level (<60, 60-79, ≥ 80)	60-79

Evaluation Table for PI 1.2.4 – Assessment of stock status

PI 1.2.4		There is an adequate assessment of the stock status		
Scoring Issue		SG 60	SG 80	SG 100
a	Appropriateness of assessment to stock under consideration			
	Guidepost		The assessment is appropriate for the stock and for the harvest control rule.	The assessment takes into account the major features relevant to the biology of the species and the nature of the UoA.
	Met?		(Y/N)	YES, stock assessments have taken into account sites, species, biology, effort, catch, size class analysis etc.
b	Assessment approach			
	Guidepost	The assessment estimates stock status relative to generic reference points appropriate to the species category.	The assessment estimates stock status relative to reference points that are appropriate to the stock and can be estimated.	
	Met?	(Y/N)	YES, fairly extensive assessments have been conducted and limit reference points established for some	

PI 1.2.4		There is an adequate assessment of the stock status		
			species; however, more work needed for the rest of the species in the fishery	
c	Uncertainty in the assessment			
	Guidepost	The assessment identifies major sources of uncertainty.	The assessment takes uncertainty into account.	The assessment takes into account uncertainty and is evaluating stock status relative to reference points in a probabilistic way.
	Met?	(Y/N)	YES, Stock assessment for target and some primary species conducted with reference points; scenario analysis done, internal peer reviews fairly ok; however, more extensive work should be conducted using longer time-series data, and for all species in the fishery.	(Y/N)
d	Evaluation of assessment			
	Guidepost			The assessment has been tested and shown to be robust. Alternative hypotheses and assessment approaches have been rigorously explored.
	Met?			YES, assessment has been tested & are robust; however, longer time-series data analysis is needed with rigorous exploration of any available alternative approaches to the stock assessment
e	Peer review of assessment			
	Guidepost		The assessment of stock status is subject to peer review.	The assessment has been internally and externally peer reviewed.
	Met?		(Y/N)	YES, assessments have been subjected to extensive reviews; SNAP, LBSPR models etc.
Overall PI justification		Stock assessments have taken into account sites, species, biology, effort, catch, size class analysis etc. Fairly extensive assessments have been conducted and limit reference points established for some species; however, more work needed for the rest of the species in the fishers; Stock assessment for target and some primary species conducted with reference points; scenario analysis done, internal peer reviews fairly okay; However, more extensive work should be conducted using longer time-series data, and for all species in the fishery; Assessment has been tested & are robust; however, longer time-series data analysis is needed with rigorous exploration of any available alternative approaches to the stock		

PI 1.2.4	There is an adequate assessment of the stock status		
	assessment; Assessments have been subjected to extensive reviews; SNAP, LBSPP models etc.		
References	CAS data from SDF&BE and KEMFRI; Frame survey reports		
	Likely PI Scoring Level (<60, 60-79, ≥ 80)		≥ 80

Principle 2 Maintenance of the fishery ecosystem

Evaluation Table for PI 2.1.1 – Primary species outcome

PI 2.1.1	The UoA aims to maintain primary species above the PRI and does not hinder recovery of primary species if they are below the PRI.		
Scoring Issue	SG 60	SG 80	SG 100
a	Main primary species stock status		
Guidepost	Main primary species are likely to be above the PRI OR If the species is below the PRI, the UoA has measures in place that are expected to ensure that the UoA does not hinder recovery and rebuilding.	Main primary species are highly likely to be above the PRI OR If the species is below the PRI, there is either evidence of recovery or a demonstrably effective strategy in place between all MSC UoAs which categorize this species as main , to ensure that they collectively do not hinder recovery and rebuilding.	There is a high degree of certainty that main primary species are above the PRI and are fluctuating around a level consistent with MSY.
Met?	NO, Stock status are below limit <i>S. Jello</i> SSB (-21.4%); below SSB _{MSY} (-9.7%) for & <i>S. obtusata</i> below limit SSB (-23.2%); below SSB _{MSY} (-21.2%)	(Y/N)	(Y/N)
b	Minor primary species stock status		
Guidepost			Minor primary species are highly likely to be above the PRI OR If below the PRI, there is evidence that the UoA does not hinder the recovery and rebuilding of minor primary species
Met?			NO, no data available, not assessed for stocks
Overall PI justification	Stock status are below limit <i>S. Jello</i> SSB (-21.4%); below SSB _{MSY} (-9.7%) for & <i>S. obtusata</i> below limit SSB (-23.2%); below SSB _{MSY} (-21.2%) No data available, not assessed for stocks		
References	CAS data form SDF&BE and KEMFRI		
RBF Required? (✓/×/)	✓ RBF for minor 1 ^o & 2 ^o species	Likely PI Scoring Level (<60, 60-79, ≥ 80)	<60

Evaluation Table for PI 2.1.2 – Primary species management strategy

PI 2.1.2	There is a strategy in place that is designed to maintain or to not hinder rebuilding of primary species, and the UoA regularly reviews and implements measures, as appropriate, to minimize the mortality of unwanted catch.			
Scoring Issue	SG 60	SG 80	SG 100	
a	Management strategy in place			
	Guidepost	There are measures in place for the UoA, if necessary, that are expected to maintain or to not hinder rebuilding of the main primary species at/to levels which are likely to above the point where recruitment would be impaired.	There is a partial strategy in place for the UoA, if necessary, that is expected to maintain or to not hinder rebuilding of the main primary species at/to levels which are highly likely to be above the point where recruitment would be impaired.	There is a strategy in place for the UoA for managing main and minor primary species.
	Met?	YES, there is a Ring net fishery management place available but enacted. The fisheries Act has measures on mesh size regulations for the ring net gear	(Y/N)	(Y/N)
b	Management strategy evaluation			
	Guidepost	The measures are considered likely to work, based on plausible argument (e.g., general experience, theory or comparison with similar fisheries/species).	There is some objective basis for confidence that the measures/partial strategy will work, based on some information directly about the fishery and/or species involved.	Testing supports high confidence that the partial strategy/strategy will work, based on information directly about the fishery and/or species involved.
	Met?	YES, Ring net fishery management plan was designed using EAF process, general regulations from the Fisheries Act on fishery management, experience from information from other fisheries such as beach seines, etc.	(Y/N)	(Y/N)
c	Management strategy implementation			
	Guidepost		There is some evidence that the measures/partial strategy is being implemented successfully .	There is clear evidence that the partial strategy/strategy is being implemented successfully and is achieving its overall objective as set out in scoring issue (a).
	Met?		NO, no specific measures implemented on the ring net fishery, general measures in the Fisheries	(Y/N)

PI 2.1.2	There is a strategy in place that is designed to maintain or to not hinder rebuilding of primary species, and the UoA regularly reviews and implements measures, as appropriate, to minimize the mortality of unwanted catch.			
			Act are implemented for the composite SSF	
d	Shark finning			
	Guidepost	It is likely that shark finning is not taking place.	It is highly likely that shark finning is not taking place.	There is a high degree of certainty that shark finning is not taking place.
	Met?	Not relevant	(Y/N/Not relevant)	(Y/N/Not relevant)
e	Review of alternative measures			
	Guidepost	There is a review of the potential effectiveness and practicality of alternative measures to minimize UoA-related mortality of unwanted catch of main primary species.	There is a regular review of the potential effectiveness and practicality of alternative measures to minimize UoA-related mortality of unwanted catch of main primary species and they are implemented as appropriate.	There is a biennial review of the potential effectiveness and practicality of alternative measures to minimize UoA-related mortality of unwanted catch of all primary species, and they are implemented, as appropriate.
	Met?	Not relevant	(Y/N/Not relevant)	(Y/N/Not relevant)
Overall PI justification	There is a ring net fishery management plan in place, available but enacted. The Fisheries Act has measures on mesh size regulations for the ring net gear. Ring net fishery management plan was designed using EAF process, general regulations from the Fisheries Act on fishery management, experience from information from other fisheries such as beach seines, etc. No specific measures implemented on the ring net fishery, general measures in the Fisheries Act are implemented for the composite SSF			
References	The Fisheries Management and Development Act of 2016			
		Likely PI Scoring Level (<60, 60-79, ≥ 80)	<60	

Evaluation Table for PI 2.1.3 – Primary species information

PI 2.1.3	Information on the nature and extent of primary species is adequate to determine the risk posed by the UoA and the effectiveness of the strategy to manage primary species		
Scoring Issue	SG 60	SG 80	SG 100
a	Information adequacy for assessment of impact on main primary species		
	Guidepost	Qualitative information is adequate to estimate the impact of the UoA on the main primary species with respect to status. OR If RBF is used to score PI 2.1.1 for the UoA: Qualitative information is adequate to estimate productivity and susceptibility attributes for main primary species.	Some quantitative information is available and is adequate to assess the impact of the UoA on the main primary species with respect to status. OR If RBF is used to score PI 2.1.1 for the UoA: Some quantitative information is adequate to assess productivity and susceptibility attributes for main primary species.

PI 2.1.3		Information on the nature and extent of primary species is adequate to determine the risk posed by the UoA and the effectiveness of the strategy to manage primary species		
	Met?	YES, some stock assessments have been done for five species (3 target, 2 primary); however, the information is inadequate and more detailed stock assessments should be conducted for the fishery with more regular CAS data, fishery surveys, routine monitoring etc.	(Y/N)	(Y/N)
b	Information adequacy for assessment of impact on minor primary species			
	Guidepost			Some quantitative information is adequate to estimate the impact of the UoA on minor primary species with respect to status.
	Met?			YES, some information available for minor species, however, detailed quantitative data for the minor species esp. on stock status is evidently lacking etc.
c	Information adequacy for management strategy			
	Guidepost	Information is adequate to support measures to manage main primary species.	Information is adequate to support a partial strategy to manage main Primary species.	Information is adequate to support a strategy to manage all primary species, and evaluate with a high degree of certainty whether the strategy is achieving its objective.
	Met?	(Y/N)	YES, adequate information is available on landings, biology etc. from CAS, routine surveys, scientific research etc. to support the Ring net management plan comprehensively including the management of the primary species	(Y/N)
Overall PI justification		Some stock assessments have been done for five species (3 target, 2 primary); however, the information is inadequate and more detailed stock assessments should be conducted for the fishery with more regular CAS data, fishery surveys, routine monitoring etc. Some information available for minor species, however, detailed quantitative data for the minor species esp. on stock status is evidently lacking etc. Adequate information is available on landings, biology etc. from CAS, routine surveys, scientific research etc. to support the Ring net management plan comprehensively including the management of the primary species		

PI 2.1.3	Information on the nature and extent of primary species is adequate to determine the risk posed by the UoA and the effectiveness of the strategy to manage primary species		
References	CAS data from SDF&BE and KEMFRI		
	Likely PI Scoring Level (<60, 60-79, ≥ 80)	60-79	

Evaluation Table for PI 2.2.1 – Secondary species outcome

PI 2.2.1	The UoA aims to maintain secondary species above a biologically based limit and does not hinder recovery of secondary species if they are below a biological based limit.			
Scoring Issue	SG 60	SG 80	SG 100	
a	Main secondary species stock status			
	Guidepost	Main Secondary species are likely to be within biologically based limits. OR If below biologically based limits, there are measures in place expected to ensure that the UoA does not hinder recovery and rebuilding.	Main secondary species are highly likely to be above biologically based limits OR If below biologically based limits, there is either evidence of recovery or a demonstrably effective partial strategy in place such that the UoA does not hinder recovery and rebuilding. AND Where catches of a main secondary species outside of biological limits are considerable, there is either evidence of recovery or a, demonstrably effective strategy in place between those MSC UoAs that also have considerable catches of the species, to ensure that they collectively do not hinder recovery and rebuilding.	There is a high degree of certainty that main secondary species are within biologically based limits.
	Met?	NO, information on the stock status of the major secondary species; no specific assessments done for the minor secondary species	(Y/N)	(Y/N)
b	Minor secondary species stock status			
	Guide post			Minor secondary species are highly likely to be above biologically based limits. OR If below biologically based limits', there is evidence that the UoA

PI 2.2.1	The UoA aims to maintain secondary species above a biologically based limit and does not hinder recovery of secondary species if they are below a biological based limit.		
			does not hinder the recovery and rebuilding of secondary species
	Met?		NO, information on the stock status of the minor secondary species; no specific assessments done for the minor secondary species
Overall PI justification	Information on the stock status of the major secondary species; no specific assessments done for the minor secondary species Information on the stock status of the minor secondary species; no specific assessments done for the minor secondary species		
References	CAS data from SDF&BE and KEMFRI		
RBF Required? (✓/✗/)	Not required	Likely PI Scoring Level (<60, 60-79, ≥ 80)	<60

Evaluation Table for PI 2.2.2 – Secondary species management strategy

PI 2.2.2	There is a strategy in place for managing secondary species that is designed to maintain or to not hinder rebuilding of secondary species and the UoA regularly reviews and implements measures, as appropriate, to minimize the mortality of unwanted catch.		
Scoring Issue	SG 60	SG 80	SG 100
a	Management strategy in place		
	Guidepost	There are measures in place, if necessary, which are expected to maintain or not hinder rebuilding of main secondary species at/to levels which are highly likely to be within biologically based limits or to ensure that the UoA does not hinder their recovery.	There is a partial strategy in place, if necessary, for the UoA that is expected to maintain or not hinder rebuilding of main secondary species at/to levels which are highly likely to be within biologically based limits or to ensure that the UoA does not hinder their recovery.
	Met?	NO, but measures in place for general SSF, little data and information on secondary species stocks, no specific plans for the secondary species	(Y/N)
			There is a strategy in place for the UoA for managing main and minor secondary species.
	Met?	(Y/N)	(Y/N)
b	Management strategy evaluation		
	Guidepost	The measures are considered likely to work, based on plausible argument (e.g. general experience, theory or comparison with similar UoAs/species).	There is some objective basis for confidence that the measures/partial strategy will work, based on some information directly about the UoA and/or species involved.
			Testing supports high confidence that the partial strategy/strategy will work, based on information directly about the UoA and/or species involved.

PI 2.2.2		There is a strategy in place for managing secondary species that is designed to maintain or to not hinder rebuilding of secondary species and the UoA regularly reviews and implements measures, as appropriate, to minimize the mortality of unwanted catch.		
	Met?	NO, no measures, no evaluation	(Y/N)	(Y/N)
c	Management strategy implementation			
	Guidepost		There is some evidence that the measures/partial strategy is being implemented successfully .	There is clear evidence that the partial strategy/strategy is being implemented successfully and is achieving its objective as set out in scoring issue (a).
	Met?		NO, no evidence for any measures specific to the fishery being implemented	(Y/N)
d	Shark finning			
	Guidepost	It is likely that shark finning is not taking place.	It is highly likely that shark finning is not taking place.	There is a high degree of certainty that shark finning is not taking place.
	Met?	Not relevant	(Y/N/Not relevant)	(Y/N/Not relevant)
e	Review of alternative measures to minimize mortality of unwanted catch [Scoring issue need not be scored if are no unwanted catches of secondary species]			
	Guidepost	There is a review of the potential effectiveness and practicality of alternative measures to minimize UoA-related mortality of unwanted catch of main secondary species.	There is a regular review of the potential effectiveness and practicality of alternative measures to minimize UoA-related mortality of unwanted catch of main secondary species and they are implemented as appropriate.	There is a biennial review of the potential effectiveness and practicality of alternative measures to minimize UoA-related mortality of unwanted catch of all secondary species, and they are implemented, as appropriate.
	Met?	Not relevant	(Y/N/Not relevant)	(Y/N/Not relevant)
Overall PI justification		<p>There are regulations set in the Small-scale purse seine net fishery management plan; zoning/spatial limits, mesh size, net size and depth, fishing durations (day ban), closed season, licenses etc.</p> <p>Based on landings, and case studies from elsewhere, the strategy is likely to work (ref studies from literature)</p> <p>Routine monitoring of the fishery by SDF&BE & County directorates of fisheries with clear licensing plans, reporting structures for the migrant fishers etc</p> <p>The strategies has been reviewed and improved at various levels: e.g. reporting to BMUs, licensing structures, County levels changes including work permits, closure of coasts to ring nets etc.</p>		
References		Church and Obura 2005		
			Likely PI Scoring Level (<60, 60-79, ≥ 80)	<60

Evaluation Table for PI 2.2.3 – Secondary species information

PI 2.2.3	Information on the nature and amount of secondary species taken is adequate to determine the risk posed by the UoA and the effectiveness of the strategy to manage secondary species.		
Scoring Issue	SG 60	SG 80	SG 100
a	Information adequacy for assessment of impacts on main secondary species		
Guidepost	Qualitative information is adequate to estimate the impact of the UoA on the main secondary species with respect to status. OR If RBF is used to score PI 2.2.1 for the UoA: Qualitative information is adequate to estimate productivity and susceptibility attributes for main secondary species.	Some quantitative information is available and adequate to assess the impact of the UoA on main secondary species with respect to status. OR If RBF is used to score PI 2.2.1 for the UoA: Some quantitative information is adequate to assess productivity and susceptibility attributes for main secondary species.	Quantitative information is available and adequate to assess with a high degree of certainty the impact of the UoA on main secondary species with respect to status.
Met?	NO, information on secondary species (catch, effort, biology-size & sex ratios)	(Y/N)	(Y/N)
b	Information adequacy for assessment of impacts on minor secondary species		
Guide post			Some quantitative information is adequate to estimate the impact of the UoA on minor secondary species with respect to status.
Met?			NO, no information available
c	Information adequacy for management strategy		
Guide post	Information is adequate to support measures to manage main secondary species.	Information is adequate to support a partial strategy to manage main secondary species.	Information is adequate to support a strategy to manage all secondary species, and evaluate with a high degree of certainty whether the strategy is achieving its objective .
Met?	No, information is evidently lacking	(Y/N)	(Y/N)
Overall PI justification	Scanty information on secondary species (catch, effort, biology-size & sex ratios) Reliable information is evidently lacking		
References	CAS data from SDF&BE and KEMFRI		
	Likely PI Scoring Level (<60, 60-79, ≥ 80)		<60

Evaluation Table for PI 2.3.1 – ETP species outcome

PI 2.3.1	The UoA meets national and international requirements for the protection of ETP species The UoA does not hinder recovery of ETP species			
Scoring Issue	SG 60	SG 80	SG 100	
a	Effects of the UoA on population/stock within national or international limits, where applicable [Scoring issue need not be scored if there are no national or international requirements that set limits for ETP species].			
	Guidepost	Where national and/or international requirements set limits for ETP species, the effects of the UoA on the population/stock are known and likely to be within these limits.	Where national and/or international requirements set limits for ETP species, the combined effects of the MSC UoAs on the population/stock are known and highly likely to be within these limits.	Where national and/or international requirements set limits for ETP species, there is a high degree of certainty that the combined effects of the MSC UoAs are within these limits.
	Met?	NO, the international/national requirements are available, but quantitative information on the effect of the fishery are not known	(Y/N/Not relevant)	(Y/N/Not relevant)
b	Direct effects			
	Guidepost	Known direct effects of the UoA are likely to not hinder recovery of ETP species.	Known direct effects of the UoA are highly likely to not hinder recovery of ETP species.	There is a high degree of confidence that there are no significant detrimental direct effects of the UoA on ETP species.
	Met?	NO, no know direct effects; likely impacts on ETPs unknown.	(Y/N)	(Y/N)
c	Indirect effects			
	Guidepost		Indirect effects have been considered and are thought to be highly likely to not create unacceptable impacts.	There is a high degree of confidence that there are no significant detrimental indirect effects of the fishery on ETP species.
	Met?		NO, indirect effects unknown, little considered for likely impacts on ETPs	(Y/N)
Overall PI justification	The international/national requirements are available, but quantitative information on the effect of the fishery are not known There are no know direct effects; likely impacts on ETPs unknown. Indirect effects unknown, little considered for likely impacts on ETPs			
References	The Fisheries Management and Development Act 2016			
RBF Required? (✓/✗/)	✓ RBF Required for ETPs interactions	Likely PI Scoring Level (<60, 60-79, ≥ 80)	<60	

Evaluation Table for PI 2.3.2 – ETP species management strategy

PI 2.3.2	The UoA has in place precautionary management strategies designed to: <ul style="list-style-type: none"> • meet national and international requirements; • Ensure the UoA does not hinder recovery of ETP species. Also, the UoA regularly reviews and implements measures, as appropriate, to minimize the mortality of ETP species.			
Scoring Issue	SG 60	SG 80	SG 100	
a	Management strategy in place (national and international requirements) [Scoring issue need not be scored if there are no requirements for protection or rebuilding provided through national ETP legislation or international agreements].			
	Guidepost	There are measures in place that minimize the UoA-related mortality of ETP species, and are expected to be highly likely to achieve national and international requirements for the protection of ETP species.	There is a strategy in place for managing the UoA's impact on ETP species, including measures to minimize mortality, which is designed to be highly likely to achieve national and international requirements for the protection of ETP species.	There is a comprehensive strategy in place for managing the UoA's impact on ETP species, including measures to minimize mortality, which is designed to achieve above national and international requirements for the protection of ETP species.
	Met?	YES, general fisheries regulations are in place within the Fisheries Act, some are proposed in the Ring net management plan; however, fishery specific measures have not been put in place.	(Y/N/Not relevant)	(Y/N/Not relevant)
b	Management strategy in place (alternative) [Scoring issue need not be scored if there are requirements for protection or rebuilding provided through national ETP legislation or international agreements].			
	Guidepost	There are measures in place that are expected to ensure the UoA does not hinder the recovery of ETP species.	There is a strategy in place that is expected to ensure the UoA does not hinder the recovery of ETP species.	There is a comprehensive strategy in place for managing ETP species, to ensure the UoA does not hinder the recovery of ETP species
	Met?	(Y/N/Not relevant)	(Y/N/Not relevant)	YES, comprehensive measures are in place: - - sea turtle strategy - Sea turtle Action plan - Wildlife Act, on ETPs - Fisheries Act - IPOAs etc.
c	Management strategy evaluation			
	Guide post	The measures are considered likely to work, based on plausible argument (e.g. general experience, theory or comparison with	There is an objective basis for confidence that the measures/strategy will work, based on information directly about the fishery and/or the species involved.	The strategy/ comprehensive strategy is mainly based on information directly about the fishery and/or species involved, and a quantitative analysis

PI 2.3.2	<p>The UoA has in place precautionary management strategies designed to:</p> <ul style="list-style-type: none"> • meet national and international requirements; • Ensure the UoA does not hinder recovery of ETP species. <p>Also, the UoA regularly reviews and implements measures, as appropriate, to minimize the mortality of ETP species.</p>		
		similar fisheries/species).	supports high confidence that the strategy will work.
Met?		YES, the existing legislative structures will work based on information from other fisheries such as the trawls, purse seines and other fisheries etc	(Y/N)
d	Management strategy implementation		
Guidepost		There is some evidence that the measures/strategy is being implemented successfully	There is clear evidence that the strategy/ comprehensive strategy is being implemented successfully and is achieving its objective as set out in scoring issue (a) or (b)
Met?		NO, no evidence available for measures being implemented specific to the fishery	(Y/N)
e	Review of alternative measures to minimize mortality of ETP species		
Guidepost	There is a review of the potential effectiveness and practicality of alternative measures to minimize UoA-related mortality of ETP species.	There is a regular review of the potential effectiveness and practicality of alternative measures to minimize UoA-related mortality of ETP species and they are implemented as appropriate.	There is a biennial review of the potential effectiveness and practicality of alternative measures to minimize UoA-related mortality ETP species, and they are implemented, as appropriate.
Met?	NO, the Ring net plan isn't in place, no reviews planned as yet	(Y/N)	(Y/N)
Overall PI justification	<p>General fisheries regulations are in place within the Fisheries Act, some are proposed in the Ring net management plan, however, fishery specific measures have not been put in place.</p> <p>Comprehensive measures are in place: sea turtle strategy, Sea turtle Action plan - Wildlife Act, on ETPs, Fisheries Act; IPOAs etc.</p> <p>The existing legislative structures will work based on information from other fisheries such as the trawls, purse seines and other fisheries etc</p> <p>No evidence available for measures being implemented specific to the fishery</p> <p>The Ring net plan isn't in place, no reviews planned as yet</p>		
References	<p>Sea turtle strategy</p> <p>Sea turtle Action plan</p> <p>Kenya Wildlife Act, on ETPs</p> <p>Fisheries Management and Development Act of 2016</p> <p>IPOAs</p>		

PI 2.3.2	<p>The UoA has in place precautionary management strategies designed to:</p> <ul style="list-style-type: none"> • meet national and international requirements; • Ensure the UoA does not hinder recovery of ETP species. <p>Also, the UoA regularly reviews and implements measures, as appropriate, to minimize the mortality of ETP species.</p>	
	Likely PI Scoring Level (<60, 60-79, ≥ 80)	<60

Evaluation Table for PI 2.3.3 – ETP species information

PI 2.3.3	<p>Relevant information is collected to support the management of UoA impacts on ETP species, including:</p> <ul style="list-style-type: none"> • Information for the development of the management strategy; • Information to assess the effectiveness of the management strategy; and • Information to determine the outcome status of ETP species. 		
Scoring Issue	SG 60	SG 80	SG 100
a	Information adequacy for assessment of impacts		
Guidepost	<p>Qualitative information is adequate to estimate the UoA related mortality on ETP species.</p> <p>OR</p> <p>If RBF is used to score PI 2.3.1 for the UoA: Qualitative information is adequate to estimate productivity and susceptibility attributes for ETP species.</p>	<p>Some quantitative information is adequate to assess the UoA related mortality and impact and to determine whether the UoA may be a threat to protection and recovery of the ETP species.</p> <p>OR</p> <p>If RBF is used to score PI 2.3.1 for the UoA: Some quantitative information is adequate to assess productivity and susceptibility attributes for ETP species.</p>	<p>Quantitative information is available to assess with a high degree of certainty the magnitude of UoA-related impacts, mortalities and injuries and the consequences for the status of ETP species.</p>
Met?	NO, information is lacking on ETPs	(Y/N)	(Y/N)
b	Information adequacy for management strategy		
Guidepost	<p>Information is adequate to support measures to manage the impacts on ETP species.</p>	<p>Information is adequate to measure trends and support a strategy to manage impacts on ETP species.</p>	<p>Information is adequate to support a comprehensive strategy to manage impacts, minimize mortality and injury of ETP species, and evaluate with a high degree of certainty whether a strategy is achieving its objectives.</p>
Met?	NO, information is evidently lacking	(Y/N)	(Y/N)
Overall PI justification	information on ETPs is evidently lacking		
References	N/A		
	Likely PI Scoring Level (<60, 60-79, ≥ 80)	<60	

Evaluation Table for PI 2.4.1 – Habitats outcome

PI 2.4.1	The UoA does not cause serious or irreversible harm to habitat structure and function, considered on the basis of the area covered by the governance body(s) responsible for fisheries management in the area(s) where the UoA operates.		
Scoring Issue	SG 60	SG 80	SG 100
a	Commonly encountered habitat status		
Guidepost	The UoA is unlikely to reduce structure and function of the commonly encountered habitats to a point where there would be serious or irreversible harm.	The UoA is highly unlikely to reduce structure and function of the commonly encountered habitats to a point where there would be serious or irreversible harm.	There is evidence that the UoA is highly unlikely to reduce structure and function of the commonly encountered habitats to a point where there would be serious or irreversible harm.
Met?	YES, based on gear operation/deployment (ref. Okemwa et. al); the gear is unlikely to have deleterious impacts on the habitats to irrecoverable states	(Y/N)	(Y/N)
b	VME habitat status [Scoring issue need not be scored if there are no VMEs].		
Guidepost	The UoA is unlikely to reduce structure and function of the VME habitats to a point where there would be serious or irreversible harm.	The UoA is highly unlikely to reduce structure and function of the VME habitats to a point where there would be serious or irreversible harm.	There is evidence that the UoA is highly unlikely to reduce structure and function of the VME habitats to a point where there would be serious or irreversible harm.
Met?	YES, based on gear operation/deployment (ref. Okemwa et. al); the gear is unlikely to have deleterious impacts on the habitats to irrecoverable states	(Y/N/Not relevant)	(Y/N/Not relevant)
c	Minor habitat status		
Guidepost			There is evidence that the UoA is highly unlikely to reduce structure and function of the minor habitats to a point where there would be serious or irreversible harm.
Met?			YES, based on gear operation/deployment (ref. Okemwa et. al); the gear is unlikely to have deleterious impacts on the habitats to irrecoverable states
Overall PI justification	Based on gear operation/deployment (ref. Okemwa et. al); the gear is unlikely to have deleterious impacts on the habitats to irrecoverable states Based on gear operation/deployment (ref. Okemwa et. al); the gear is unlikely to have deleterious impacts on the habitats to irrecoverable states		

PI 2.4.1	The UoA does not cause serious or irreversible harm to habitat structure and function, considered on the basis of the area covered by the governance body(s) responsible for fisheries management in the area(s) where the UoA operates.		
	Based on gear operation/deployment (ref. Okemwa et. al); the gear is unlikely to have deleterious impacts on the habitats to irrecoverable states		
References	-Stakeholder consultation minutes; Okemwa et al.		
RBF Required? (✓/✗/)	X	Likely PI Scoring Level (<60, 60-79, ≥ 80)	60-79

Evaluation Table for PI 2.4.2 – Habitats management strategy

PI 2.4.2	There is a strategy in place that is designed to ensure the UoA does not pose a risk of serious or irreversible harm to the habitats.		
Scoring Issue	SG 60	SG 80	SG 100
a	Management strategy in place		
Guide post	There are measures in place, if necessary, that are expected to achieve the Habitat Outcome 80 level of performance.	There is a partial strategy in place, if necessary, that is expected to achieve the Habitat Outcome 80 level of performance or above.	There is a strategy in place for managing the impact of all MSC UoAs/non-MSC fisheries on habitats.
Met?	YES, Ring net management plan is not in place, but general measures on fisheries from the Fisheries Act, Co-mgt, BMUs, CCAs, MPAs etc. are in place on operations etc.	(Y/N)	(Y/N)
b	Management strategy evaluation		
Guide post	The measures are considered likely to work, based on plausible argument (e.g. general experience, theory or comparison with similar UoAs/habitats).	There is some objective basis for confidence that the measures/partial strategy will work, based on information directly about the UoA and/or habitats involved.	Testing supports high confidence that the partial strategy/strategy will work, based on information directly about the UoA and/or habitats involved.
Met?	YES, based on general measures on fisheries from the Fisheries Act, Co-mgt, BMUs, CCAs, MPAs etc. the proposed measures in the Draft Ring net plan are likely to work	(Y/N)	(Y/N)
c	Management strategy implementation		
Guide post		There is some quantitative evidence that the measures/partial strategy is being implemented successfully.	There is clear quantitative evidence that the partial strategy/strategy is being implemented successfully and is achieving its objective, as outlined in scoring issue (a).
Met?		YES, there is plausible evidence based on research and surveys that the general measures are being implemented successfully	(Y/N)

PI 2.4.2		There is a strategy in place that is designed to ensure the UoA does not pose a risk of serious or irreversible harm to the habitats.		
d	Compliance with management requirements and other MSC UoAs'/non-MSC fisheries' measures to protect VMEs [Scoring issue need not be scored if there are no VMEs].			
	Guide post	There is qualitative evidence that the UoA complies with its management requirements to protect VMEs.	There is some quantitative evidence that the UoA complies with both its management requirements and with protection measures afforded to VMEs by other MSC UoAs/non-MSC fisheries, where relevant.	There is clear quantitative evidence that the UoA complies with both its management requirements and with protection measures afforded to VMEs by other MSC UoAs/non-MSC fisheries, where relevant.
	Met?	YES, the ring net fishery has fairly complied with requirements for VMEs e.g. no fishing in MPAs, CCAs, etc; reporting to BMUs especially for the migrant fishers, general compliance with BMU (fisheries regulations 2007) etc.	(Y/N/Not relevant)	(Y/N/Not relevant)
Overall PI justification		Ring net management plan is not in place, but general measures on fisheries from the Fisheries Act, Co-mgt, BMUs, CCAs, MPAs etc. are in place on operations etc. Based on general measures on fisheries from the Fisheries Act, Co-mgt, BMUs, CCAs, MPAs etc. the proposed measures in the Draft Ring net plan are likely to work there is plausible evidence based on research and surveys that the general measures are being implemented successfully The ring net fishery has fairly complied with requirements for VMEs e.g. no fishing in MPAs, CCAs, etc; reporting to BMUs especially for the migrant fishers, general compliance with BMU (fisheries regulations 2007) etc.		
References		Fisheries Management and Development Act 2016; BMU regulations 2007; Church and Obura 2004		
			Likely PI Scoring Level (<60, 60-79, ≥ 80)	60-79

Evaluation Table for PI 2.4.3 – Habitats information

PI 2.4.3		Information is adequate to determine the risk posed to the habitat by the UoA and the effectiveness of the strategy to manage impacts on the habitat.		
Scoring Issue		SG 60	SG 80	SG 100
a	Information quality			
	Guide post	The types and distribution of the main habitats are broadly understood. OR If CSA is used to score PI 2.4.1 for the UoA: Qualitative information is adequate to estimate the types and distribution of the main habitats.	The nature, distribution and vulnerability of the main habitats in the UoA area are known at a level of detail relevant to the scale and intensity of the UoA. OR If CSA is used to score PI 2.4.1 for the UoA: Some quantitative information is available and is adequate to estimate the types and	The distribution of all habitats is known over their range, with particular attention to the occurrence of vulnerable habitats.

PI 2.4.3	Information is adequate to determine the risk posed to the habitat by the UoA and the effectiveness of the strategy to manage impacts on the habitat.		
			distribution of the main habitats.
Met?	YES, habitat distribution broadly understood, some mapping done	(Y/N)	(Y/N)
b	Information adequacy for assessment of impacts		
Guidepost	Information is adequate to broadly understand the nature of the main impacts of gear use on the main habitats, including spatial overlap of habitat with fishing gear. OR If CSA is used to score PI 2.4.1 for the UoA: Qualitative information is adequate to estimate the consequence and spatial attributes of the main habitats.	Information is adequate to allow for identification of the main impacts of the UoA on the main habitats, and there is reliable information on the spatial extent of interaction and on the timing and location of use of the fishing gear. OR If CSA is used to score PI 2.4.1 for the UoA: Some quantitative information is available and is adequate to estimate the consequence and spatial attributes of the main habitats.	The physical impacts of the gear on all habitats have been quantified fully.
Met?	YES, habitat distribution broadly understood, some mapping done Ref: Thoya et al	(Y/N)	(Y/N)
c	Monitoring		
Guidepost		Adequate information continues to be collected to detect any increase in risk to the main habitats.	Changes in habitat distributions over time are measured.
Met?		Yes, although no monitoring currently on going. Previous studies on habitats conducted, overlap maps of the fishery undertaken	(Y/N)
Overall PI justification	Habitat distribution broadly understood, some mapping done habitat distribution broadly understood, some mapping done Ref: Thoya et al Although no monitoring currently on going. Previous studies on habitats conducted, overlap maps of the fishery undertaken		
References	Thoya et al , Management plan, KMFRI Biodiversity reports; Painter, Cortes and Engels, 2001		
	Likely PI Scoring Level (<60, 60-79, ≥ 80)	60-79	

Evaluation Table for PI 2.5.1 – Ecosystem outcome

PI 2.5.1	The UoA does not cause serious or irreversible harm to the key elements of ecosystem structure and function.		
Scoring Issue	SG 60	SG 80	SG 100
a	Ecosystem status		
Guidepost	The UoA is unlikely to disrupt the key elements underlying ecosystem structure and function to a point where there would be a serious or irreversible harm.	The UoA is highly unlikely to disrupt the key elements underlying ecosystem structure and function to a point where there would be a serious or irreversible harm.	There is evidence that the UoA is highly unlikely to disrupt the key elements underlying ecosystem structure and function to a point where there would be a serious or irreversible harm.
Met?	YES, based on gear operation/deployment (ref. Okemwa et. al); the gear is unlikely to have deleterious impacts on the key elements of the ecosystems to irreversible states	(Y/N/Partial)	(Y/N/Partial)
Overall PI justification	Based on gear operation/deployment (ref. Okemwa et. al); the gear is unlikely to have deleterious impacts on the key elements of the ecosystems to irreversible states		
References	Okemwa et al,		
RBF Required? (✓/✗/)	X	Likely PI Scoring Level (<60, 60-79, ≥ 80)	60-79

Evaluation Table for PI 2.5.2 – Ecosystem management strategy

PI 2.5.2	There are measures in place to ensure the UoA does not pose a risk of serious or irreversible harm to ecosystem structure and function.		
Scoring Issue	SG 60	SG 80	SG 100
a	Management strategy in place		
Guidepost	There are measures in place, if necessary which take into account the potential impacts of the fishery on key elements of the ecosystem.	There is a partial strategy in place, if necessary, which takes into account available information and is expected to restrain impacts of the UoA on the ecosystem so as to achieve the Ecosystem Outcome 80 level of performance.	There is a strategy that consists of a plan , in place which contains measures to address all main impacts of the UoA on the ecosystem, and at least some of these measures are in place.
Met?	Yes, there are some measures in place but not specific to the fishery	(Y/N)	(Y/N)
b	Management strategy evaluation		
Guidepost	The measures are considered likely to work, based on plausible argument (e.g., general experience, theory or comparison with similar fisheries/ ecosystems).	There is some objective basis for confidence that the measures/partial strategy will work, based on some information directly about the UoA and/or the ecosystem involved	Testing supports high confidence that the partial strategy/strategy will work, based on information directly about the UoA and/or ecosystem involved
Met?	Yes, there are some evaluations in place but not specific to the fishery	(Y/N)	(Y/N)

PI 2.5.2	There are measures in place to ensure the UoA does not pose a risk of serious or irreversible harm to ecosystem structure and function.			
c	Management strategy implementation			
	Guidepost		There is some evidence that the measures/partial strategy is being implemented successfully .	There is clear evidence that the partial strategy/strategy is being implemented successfully and is achieving its objective as set out in scoring issue (a) .
	Met?		Yes, there are some implementation in place but not specific to the fishery	(Y/N)
Overall PI justification	There are some measures in place but not specific to the fishery			
References	Fisheries Management and Development Act , 2016; Ring-net Management Plan draft			
			Likely PI Scoring Level (<60, 60-79, ≥ 80)	60-79

Evaluation Table for PI 2.5.3 – Ecosystem information

PI 2.5.3	There is adequate knowledge of the impacts of the UoA on the ecosystem.			
Scoring Issue	SG 60	SG 80	SG 100	
a	Information quality			
	Guidepost	Information is adequate to identify the key elements of the ecosystem.	Information is adequate to broadly understand the key elements of the ecosystem.	
	Met?	(Y/N)	Yes, research conducted by KMFRI, WCS, CORDIO, CM Roberts 1995, McClanahan 1995, Vijyeman, Kaunda-Arara 2010, Cervený, 2011, RV Mtafiti Territorial surveys, RV Mtafiti book, State of the Marine Fisheries report 2018, State of the Coast report etc	
b	Investigation of UoA impacts			
	Guidepost	Main impacts of the UoA on these key ecosystem elements can be inferred from existing information, but have not been investigated in detail.	Main impacts of the UoA on these key ecosystem elements can be inferred from existing information, and some have been investigated in detail .	Main interactions between the UoA and these ecosystem elements can be inferred from existing information, and have been investigated in detail .
	Met?	Yes, but have not been investigated	(Y/N)	(Y/N)
c	Understanding of component functions			
	Guidepost		The main functions of the components (i.e., P1 target species, primary, secondary and ETP species	The impacts of the UoA on P1 target species, primary, secondary and ETP species and Habitats are identified and the

PI 2.5.3		There is adequate knowledge of the impacts of the UoA on the ecosystem.	
		and Habitats) in the ecosystem are known .	main functions of these components in the ecosystem are understood .
	Met?	Yes, broadly in the ecosystem they are known. research conducted by KMFRI, WCS, CORDIO, CM Roberts 1995, McClanahan 1995, Vijyeman, Kaunda-Arara 2010, Cerveny, 2011, RV Mtafiti Territorial surveys, RV Mtafiti book, State of the Marine Fisheries report 2018, State of the Coast report etc	(Y/N)
d	Information relevance		
	Guidepost	Adequate information is available on the impacts of the UoA on these components to allow some of the main consequences for the ecosystem to be inferred.	Adequate information is available on the impacts of the UoA on the components and elements to allow the main consequences for the ecosystem to be inferred.
	Met?	(YES. Some information exists on research conducted by KMFRI, WCS, CORDIO, CM Roberts 1995, McClanahan 1995, Vijyeman, Kaunda-Arara 2010, Cerveny, 2011, RV Mtafiti Territorial surveys, RV Mtafiti book, State of the Marine Fisheries report 2018, State of the Coast report)	(Y/N)
e	Monitoring		
	Guidepost	Adequate data continue to be collected to detect any increase in risk level.	Information is adequate to support the development of strategies to manage ecosystem impacts.
	Met?	(NO. No systematic collection of monitoring data is ongoing)	(Y/N)
Overall PI justification	Research conducted by KMFRI, WCS, CORDIO, CM Roberts 1995, McClanahan 1995, Vijyeman, Kaunda-Arara 2010, Cerveny, 2011, RV Mtafiti Territorial surveys, RV Mtafiti book, State of the Marine Fisheries report 2018, State of the Coast report. Impacts have not been investigated; but broadly in the ecosystem they are known. research conducted by KMFRI, WCS, CORDIO, CM Roberts 1995, McClanahan 1995, Vijyeman, Kaunda-Arara 2010, Cerveny, 2011, RV Mtafiti Territorial surveys, RV Mtafiti book, State of the Marine Fisheries report 2018, State of the Coast report Some information exists on research conducted by KMFRI, WCS, CORDIO, CM Roberts 1995, McClanahan 1995, Vijyeman, Kaunda-Arara 2010, Cerveny, 2011, RV Mtafiti Territorial surveys, RV Mtafiti book, State of the Marine Fisheries report		

PI 2.5.3	There is adequate knowledge of the impacts of the UoA on the ecosystem.
	2018, State of the Coast report); No systematic collection of monitoring data is ongoing
References	KMFRI report, WCS report, CORDIO report, CM Roberts 1995, McClanahan 1995, Vijyeman, Kaunda-Arara 2010, Cervený, 2011, RV Mtafiti Territorial surveys, RV Mtafiti book, State of the Marine Fisheries report 2018, State of the Coast report
	Likely PI Scoring Level (<60, 60-79, ≥ 80)
	<60

Principle 3 Effective and responsible management

Evaluation Table for PI 3.1.1 – Legal and/or customary framework

PI 3.1.1	The management system exists within an appropriate legal and/or customary framework which ensures that it: <ul style="list-style-type: none"> Is capable of delivering sustainability in the UoA(s); and Observes the legal rights created explicitly or established by custom of people dependent on fishing for food or livelihood; and Incorporates an appropriate dispute resolution framework. 		
Scoring Issue	SG 60	SG 80	SG 100
a	Compatibility of laws or standards with effective management		
Guidepost	There is an effective national legal system and a framework for cooperation with other parties, where necessary, to deliver management outcomes consistent with MSC Principles 1 and 2	There is an effective national legal system and organized and effective cooperation with other parties, where necessary, to deliver management outcomes consistent with MSC Principles 1 and 2.	There is an effective national legal system and binding procedures governing cooperation with other parties which delivers management outcomes consistent with MSC Principles 1 and 2.
Met?	(YES, Fisheries law in place, BMU regulations, ICZM framework, Kenya constitution of Kenya 2010; Wildlife Act, EMCA etc)	(Y/N)	Y/N)
b	Resolution of disputes		
Guidepost	The management system incorporates or is subject by law to a mechanism for the resolution of legal disputes arising within the system.	The management system incorporates or is subject by law to a transparent mechanism for the resolution of legal disputes which is considered to be effective in dealing with most issues and that is appropriate to the context of the UoA.	The management system incorporates or is subject by law to a transparent mechanism for the resolution of legal disputes that is appropriate to the context of the fishery and has been tested and proven to be effective .
Met?	(Y/N)	(YES, the legal systems are in place from BMU, co-mgt, Fisheries Act etc. but some flaws exist in the implementation etc)	(Y/N)
c	Respect for rights		
Guidepost	The management system has a mechanism to generally respect the legal rights created explicitly or established by custom of	The management system has a mechanism to observe the legal rights created explicitly or established by custom of	The management system has a mechanism to formally commit to the legal rights created explicitly or established by

PI 3.1.1	<p>The management system exists within an appropriate legal and/or customary framework which ensures that it:</p> <ul style="list-style-type: none"> • Is capable of delivering sustainability in the UoA(s); and • Observes the legal rights created explicitly or established by custom of people dependent on fishing for food or livelihood; and • Incorporates an appropriate dispute resolution framework. 		
	people dependent on fishing for food or livelihood in a manner consistent with the objectives of MSC Principles 1 and 2.	people dependent on fishing for food or livelihood in a manner consistent with the objectives of MSC Principles 1 and 2.	custom of people dependent on fishing for food and livelihood in a manner consistent with the objectives of MSC Principles 1 and 2.
Met?	(Y/N)	(Y/N)	(YES, BMUs regulations show clear mandate to commit legal rights to resource users, Constitution of Kenya and Fisheries Act etc)
Overall PI justification	<p>The legal systems are in place from BMU, co-mgt, Fisheries Act etc. but some flaws exist in the implementation BMUs regulations show clear mandate to commit legal rights to resource users Fisheries law in place, BMU regulations, ICZM framework, Kenya constitution of Kenya 2010; Wildlife Act, EMCA etc) The legal systems are in place from BMU, co-mgt, Fisheries Act etc. but some flaws exist in the implementation etc BMUs regulations show clear mandate to commit legal rights to resource users, Constitution of Kenya and Fisheries Act etc)</p>		
References	[BMU Regulations, Constitution, Fisheries Management and Development Act, Ombudsman		
		Likely PI Scoring Level (<60, 60-79, ≥ 80)	60-79

Evaluation Table for PI 3.1.2 – Consultation, roles and responsibilities

PI 3.1.2	<p>The management system has effective consultation processes that are open to interested and affected parties. The roles and responsibilities of organizations and individuals who are involved in the management process are clear and understood by all relevant parties</p>		
Scoring Issue	SG 60	SG 80	SG 100
a	Roles and responsibilities		
Guidepost	Organizations and individuals involved in the management process have been identified. Functions, roles and responsibilities are generally understood .	Organizations and individuals involved in the management process have been identified. Functions, roles and responsibilities are explicitly defined and well understood for key areas of responsibility and interaction.	Organizations and individuals involved in the management process have been identified. Functions, roles and responsibilities are explicitly defined and well understood for all areas of responsibility and interaction.
Met?	(Y/N)	(Y/N)	(YES, explicitly defined & well understood for key areas of responsibility & interaction as per legal framework e.g. Wildlife Act for ETPs, EMCA for environmental issues etc.)
b	Consultation processes		

PI 3.1.2		The management system has effective consultation processes that are open to interested and affected parties. The roles and responsibilities of organizations and individuals who are involved in the management process are clear and understood by all relevant parties		
	Guide post	The management system includes consultation processes that obtain relevant information from the main affected parties, including local knowledge, to inform the management system.	The management system includes consultation processes that regularly seek and accept relevant information, including local knowledge. The management system demonstrates consideration of the information obtained.	The management system includes consultation processes that regularly seek and accept relevant information, including local knowledge. The management system demonstrates consideration of the information and explains how it is used or not used.
	Met?	(Y/N)	(YES, Consultation processes are in place but not regular based on time frames, to inform management system)	(Y/N)
c	Participation			
	Guide post		The consultation process provides opportunity for all interested and affected parties to be involved.	The consultation process provides opportunity and encouragement for all interested and affected parties to be involved, and facilitates their effective engagement.
	Met?		(Y/N)	YES, Consultations are encouraged, opportunities provided, and facilitation for BMUs, Stakeholders etc. given wherever opportunity arises
Overall PI justification		-Explicitly defined & well understood for key areas of responsibility & interaction as per legal framework e.g. Wildlife Act for ETPs, EMCA for environmental issues etc.) -Consultation processes are in place but not regular based on time frames, to inform management system) -Consultations are encouraged, opportunities provided, and facilitation for BMUs, Stakeholders etc. given wherever opportunity arises		
References		Existing Acts; the constitution; Fisheries Management and Development Act,2016; BMU regulations; EMCA 1999;Wildlife Act		
			Likely PI Scoring Level (<60, 60-79, ≥ 80)	≥ 80

Evaluation Table for PI 3.1.3 – Long term objectives

PI 3.1.3		The management policy has clear long-term objectives to guide decision-making that are consistent with MSC fisheries standard, and incorporates the precautionary approach.		
Scoring Issue		SG 60	SG 80	SG 100
a	Objectives			
	Guidepost	Long-term objectives to guide decision-making, consistent with the MSC fisheries standard and the precautionary approach,	Clear long-term objectives that guide decision-making, consistent with MSC fisheries standard and the precautionary approach are explicit	Clear long-term objectives that guide decision-making, consistent with MSC fisheries standard and the precautionary approach, are explicit

PI 3.1.3	The management policy has clear long-term objectives to guide decision-making that are consistent with MSC fisheries standard, and incorporates the precautionary approach.		
	are implicit within management policy.	within management policy.	within and required by management policy.
Met?	(Y/N/Partial)	(Y/N/Partial)	YES, Fisheries Act: calls for EAF approach to management at no less standards than defined in international agreements; IOTC, UNCLOS, IPOAs etc.
Overall PI justification	- Fisheries Act: calls for EAF approach to management at no less standards than defined in international agreements; IOTC, UNCLOS, IPOAs etc.		
References	Existing Acts, international legal instruments		
	Likely PI Scoring Level (<60, 60-79, ≥ 80)		≥ 80

Evaluation Table for PI 3.2.1 Fishery-specific objectives

PI 3.2.1	The fishery-specific management system has clear, specific objectives designed to achieve the outcomes expressed by MSC's Principles 1 and 2.		
Scoring Issue	SG 60	SG 80	SG 100
a	Objectives		
Guide post	Objectives , which are broadly consistent with achieving the outcomes expressed by MSC's Principles 1 and 2, are implicit within the fishery-specific management system.	Short and long-term objectives , which are consistent with achieving the outcomes expressed by MSC's Principles 1 and 2, are explicit within the fishery-specific management system.	Well defined and measurable short and long-term objectives , which are demonstrably consistent with achieving the outcomes expressed by MSC's Principles 1 and 2, are explicit within the fishery-specific management system.
Met?	(Y/N/Partial)	Partial, there is a draft management plan awaiting to be gazetted; Co management plans such as the Shimoni-Vanga co-mgt plan.	(Y/N/Partial)
Overall PI justification	-There is a draft management plan waiting to be gazetted; Co management plans such as the Shimoni-Vanga co-mgt plan.		
References	The Draft Plan, Shimoni-Vanga Co-mgt plan and Malindi-Ungwana Co-mgt Plan		
	Likely PI Scoring Level (<60, 60-79, ≥ 80)		60-79

Evaluation Table for PI 3.2.2 – Decision-making processes

PI 3.2.2	The fishery-specific management system includes effective decision-making processes that result in measures and strategies to achieve the objectives, and has an appropriate approach to actual disputes in the fishery.		
Scoring Issue	SG 60	SG 80	SG 100
a	Decision-making processes		
Guidepost	There are some decision-making processes in place that	There are established decision-making processes that result in measures and	

PI 3.2.2	The fishery-specific management system includes effective decision-making processes that result in measures and strategies to achieve the objectives, and has an appropriate approach to actual disputes in the fishery.			
		result in measures and strategies to achieve the fishery-specific objectives.	strategies to achieve the fishery-specific objectives.	
Met?	(Y/N)		YES, but responds only to serious issues esp. with regards to fisheries, ecosystems, governance etc. since the Plan has not yet been implemented.	
b	Responsiveness of decision-making processes			
Guide post	Decision-making processes respond to serious issues identified in relevant research, monitoring, evaluation and consultation, in a transparent, timely and adaptive manner and take some account of the wider implications of decisions.	Decision-making processes respond to serious and other important issues identified in relevant research, monitoring, evaluation and consultation, in a transparent, timely and adaptive manner and take account of the wider implications of decisions.	Decision-making processes respond to all issues identified in relevant research, monitoring, evaluation and consultation, in a transparent, timely and adaptive manner and take account of the wider implications of decisions.	
Met?	(Y/N)		YES, the responsiveness to development of the Plan and initiation of monitoring program.	(Y/N)
c	Use of precautionary approach			
Guidepost		Decision-making processes use the precautionary approach and are based on best available information.		
Met?		Yes, EAF approach well streamlined and incorporated in management		
d	Accountability and transparency of management system and decision-making process			
Guidepost	Some information on the fishery's performance and management action is generally available on request to stakeholders.	Information on the fishery's performance and management action is available on request and explanations are provided for any actions or lack of action associated with findings and relevant recommendations emerging from research, monitoring, evaluation and review activity.	Formal reporting to all interested stakeholders provides comprehensive information on the fishery's performance and management actions and describes how the management system responded to findings and relevant recommendations emerging from research, monitoring, evaluation and review activity.	
Met?	(Y/N)		YES, information on the fishery's performance & management action is available on request, with	(Y/N)

PI 3.2.2	The fishery-specific management system includes effective decision-making processes that result in measures and strategies to achieve the objectives, and has an appropriate approach to actual disputes in the fishery.			
			recommendations from research, M&E etc.	
e	Approach to disputes			
	Guidepost	Although the management authority or fishery may be subject to continuing court challenges, it is not indicating a disrespect or defiance of the law by repeatedly violating the same law or regulation necessary for the sustainability for the fishery.	The management system or fishery is attempting to comply in a timely fashion with judicial decisions arising from any legal challenges.	The management system or fishery acts proactively to avoid legal disputes or rapidly implements judicial decisions arising from legal challenges.
	Met?	(Y/N)	YES, a lot of effort has been put into dispute resolution, attempts to comply are evident by the management	(Y/N)
Overall PI justification	Decision making processes respond only to serious issues esp. with regards to fisheries, ecosystems, governance etc. since the Plan has not yet been implemented The responsiveness to development of the Plan and initiation of monitoring program. EAF approach well streamlined and incorporated in management Information on the fishery's performance & management action is available on request, with recommendations from research, M&E etc. A lot of effort has been put into dispute resolution, attempts to comply are evident by the management			
References	The Fisheries Management Act 2016			
		Likely PI Scoring Level (<60, 60-79, ≥ 80)	60-79	

Evaluation Table for PI 3.2.3 – Compliance and enforcement

PI 3.2.3	Monitoring, control and surveillance mechanisms ensure the management measures in the fishery are enforced and complied with.			
Scoring Issue	SG 60	SG 80	SG 100	
a	MCS implementation			
	Guide post	Monitoring, control and surveillance mechanisms exist, and are implemented in the fishery and there is a reasonable expectation that they are effective.	A monitoring, control and surveillance system has been implemented in the fishery and has demonstrated an ability to enforce relevant management measures, strategies and/or rules.	A comprehensive monitoring, control and surveillance system has been implemented in the fishery and has demonstrated a consistent ability to enforce relevant management measures, strategies and/or rules.
	Met?	YES, MCS mechanisms generally in place, occasionally implemented.	(Y/N)	(Y/N)

PI 3.2.3	Monitoring, control and surveillance mechanisms ensure the management measures in the fishery are enforced and complied with.		
	some degree of effectiveness is evident		
b	Sanctions		
Guide post	Sanctions to deal with non-compliance exist and there is some evidence that they are applied.	Sanctions to deal with non-compliance exist, are consistently applied and thought to provide effective deterrence.	Sanctions to deal with non-compliance exist, are consistently applied and demonstrably provide effective deterrence.
Met?	YES, General sanctions exist in Fisheries Act, BMU by laws, not specific to small purse seine fisheries, the regulations are clear, but enforcement is still weak with little evidence available for sanctions etc	(Y/N)	(Y/N)
c	Compliance		
Guide post	Fishers are generally thought to comply with the management system for the fishery under assessment, including, when required, providing information of importance to the effective management of the fishery.	Some evidence exists to demonstrate fishers comply with the management system under assessment, including, when required, providing information of importance to the effective management of the fishery.	There is a high degree of confidence that fishers comply with the management system under assessment, including, providing information of importance to the effective management of the fishery.
Met?	YES, generally thought to comply, but no evidence exists to show compliance, information provision etc.	(Y/N)	(Y/N)
d	Systematic non-compliance		
Guide post		There is no evidence of systematic non-compliance.	
Met?		YES, there is no evidence of systematic non-compliance, and generally, the fishers comply with legislation, licensing provisions etc.	
Overall PI justification	MCS mechanisms generally in place, occasionally implemented, some degree of effectiveness is evident General sanctions exist in Fisheries Act, BMU by laws, not specific to small purse seine fisheries, the regulations are clear, but enforcement is still weak with little evidence available for sanctions etc Generally thought to comply, but no evidence exists to show compliance, information provision etc. There is no evidence of systematic non-compliance, and generally, the fishers comply with legislation, licensing provisions etc.		
References	Fisheries Management and Development Act, 2016; BMU regulations 2007		
	Likely PI Scoring Level (<60, 60-79, ≥ 80)	60-79	

Evaluation Table for PI 3.2.4 – Monitoring and management performance evaluation

PI 3.2.4	There is a system of monitoring and evaluating the performance of the fishery-specific management system against its objectives. There is effective and timely review of the fishery-specific management system.		
Scoring Issue	SG 60	SG 80	SG 100
a	Evaluation coverage		
Guide post	There are mechanisms in place to evaluate some parts of the fishery-specific management system.	There are mechanisms in place to evaluate key parts of the fishery-specific management system	There are mechanisms in place to evaluate all parts of the fishery-specific management system.
Met?	NO, and some aspects need redress e.g. by-catch, ETP issues, conflicts with other fisheries, effort etc.	(Y/N)	(Y/N)
b	Internal and/or external review		
Guide post	The fishery-specific management system is subject to occasional internal review.	The fishery-specific management system is subject to regular internal and occasional external review.	The fishery-specific management system is subject to regular internal and external review.
Met?	NO, but some occasional assessments done, esp. with ref to research with other fisheries.	(Y/N)	(Y/N)
Overall PI justification	-No mechanism to evaluate the system, but some aspects need redress e.g. by-catch, ETP issues, conflicts with other fisheries, effort etc. Occasional assessments done, esp. with ref to research with other fisheries.		
References	Stakeholder consultations		
	Likely PI Scoring Level (<60, 60-79, ≥ 80)		<60

Appendix 2: MSC's BMT Baseline Status & 5-year projections for the Small Purse Seine Fishery

Principle	Component	Performance Indicator	Actual 2019	Expected 2020	Expected 2021	Expected 2022	Expected 2023
1	Outcome	1.1.1 Stock status	60-79	60-79	60-79	≥80	≥80
		1.1.2 Stock rebuilding	<60	<60	<60	60-79	60-79
	Management	1.2.1 Harvest Strategy	<60	<60	<60	60-79	60-79
		1.2.2 Harvest control rules and	<60	<60	<60	60-79	60-79
		1.2.3 Information and monitoring	60-79	60-79	≥80	≥80	≥80
	1.2.4 Assessment of stock status	≥80	≥80	≥80	≥80	≥80	
2	Primary species	2.1.1 Outcome	<60	<60	<60	60-79	60-79
		2.1.2 Management	<60	<60	<60	60-79	60-79
		2.1.3 Information	60-79	60-79	≥80	≥80	≥80
	Secondary species	2.2.1 Outcome	<60	<60	<60	60-79	60-79
		2.2.2 Management	<60	<60	<60	60-79	60-79
		2.2.3 Information	<60	60-79	≥80	≥80	≥80
	ETP species	2.3.1 Outcome	<60	<60	<60	60-79	60-79
		2.3.2 Management	<60	<60	<60	60-79	60-79
		2.3.3 Information	<60	60-79	60-79	≥80	≥80
	Habitats	2.4.1 Outcome	60-79	60-79	60-79	60-79	≥80
		2.4.2 Management	60-79	60-79	60-79	60-79	≥80
		2.4.3 Information	60-79	60-79	≥80	≥80	≥80
	Ecosystem	2.5.1 Outcome	60-79	60-79	60-79	60-79	≥80
2.5.2 Management		60-79	60-79	60-79	60-79	≥80	
2.5.3 Information		<60	<60	60-79	60-79	≥80	
3	Governance and Policy	3.1.1 Legal and customary	60-79	60-79	60-79	60-79	≥80
		3.1.2 Consultation, roles and responsibilities	≥80	≥80	≥80	≥80	≥80
		3.1.3 Long term objectives	≥80	≥80	≥80	≥80	≥80
	Fishery specific management system	3.2.1 Fishery specific objectives	60-79	60-79	60-79	≥80	≥80
		3.2.2 Decision making processes	60-79	60-79	60-79	≥80	≥80
		3.2.3 Compliance and enforcement	60-79	60-79	60-79	≥80	≥80
		3.2.4 Management performance evaluation	<60	<60	<60	60-79	60-79
Total number of PIs equal to or greater than 80			3	3	7	12	18
Total number of PIs 60-79			12	14	11	16	10
Total number of PIs less than 60			13	11	10	0	0
Overall BMT Index			0.32	0.36	0.45	0.71	0.82

Appendix 3: MSC Pre-assessment Results for the *T. albacares* Tuna FisheryPrinciple 1: Sustainability of exploited fish stocks (*Thunnus albacares*)

Evaluation Table for PI 1.1.1 – Stock status

PI 1.1.1	The stock is at a level which maintains high productivity and has a low probability of recruitment overfishing		
Scoring Issue	SG 60	SG 80	SG 100
a	Stock status relative to recruitment impairment		
Guidepost	It is likely that the stock is above the point where recruitment would be impaired (PRI).	It is highly likely that the stock is above the PRI.	There is a high degree of certainty that the stock is above the PRI.
Met?	No, <i>T. albacares</i> stock in WIO region is currently overfished and subject to overfishing as per summary of stock status by IOTC, 2018.	(Y/N)	(Y/N)
b	Stock status in relation to achievement of MSY		
Guide post		The stock is at or fluctuating around a level consistent with MSY.	There is a high degree of certainty that the stock has been fluctuating around a level consistent with MSY or has been above this level over recent years.
Met?		No. MSY for <i>T. albacares</i> is 403,000 Mt/yr. Average annual catches 2013 – 2017 was 399,830 Mt. In 2017 catch was 409,567 = overfishing	(Y/N)
Overall PI justification	YFT: F_{curr}/F_{msy} ranges 1 - 1.71; Mean = 1.20 <i>T. albacares</i> stock in WIO region is currently overfished and subject to overfishing as per summary of stock status by IOTC, 2018. MSY for <i>T. albacares</i> is 403,000 Mt/yr. Average annual catches 2013 – 2017 was 399,830 Mt. In 2017 catch was 409,567 = overfishing		
References	IOTC reports		
RBF Required? (✓/✗/)	X	Likely PI Scoring Level (<60, 60-79, ≥ 80)	<60
Stock Status relative to Reference Points			
	Type of reference point	Value of reference point	Current stock status relative to reference point
Reference point used in scoring stock relative to PRI (SIa)	$SB_{current}$ SB_{MSY}	SB_{CURR}/SB_{MSY} : 0.83 (0.74 – 0.97) SB_{MSY} =1069Mt (789 – 1397)	SB_{CURR}/SB_{virgin} =0.30 (0.27 – 0.33)

PI 1.1.1	The stock is at a level which maintains high productivity and has a low probability of recruitment overfishing		
Scoring Issue	SG 60	SG 80	SG 100
Reference point used in scoring stock relative to MSY (SIb)	F_{CURR} F_{MSY}	$F_{CURR}=0.18$ $F_{MSY}=0.15$ $MSY = 403,000t$ $Curr = 409,000t$	$F_{CURR}/F_{MSY}=1.20$

Evaluation Table for PI 1.1.1A - key LTL [NOTE: only use this table for stocks identified as key LTL]

PI 1.1.1 A	The stock is at a level which has a low probability of serious ecosystem impacts		
Scoring Issue	SG 60	SG 80	SG 100
a	Stock status relative to ecosystem impairment		
Guidepost	It is likely that the stock is above the point where serious ecosystem impacts could occur.	It is highly likely that the stock is above the point where serious ecosystem impacts could occur.	There is a high degree of certainty that the stock is above the point where serious ecosystem impacts could occur.
Met?	N/A	(Y/N)	(Y/N)
b	Stock status in relation to ecosystem needs		
Guidepost		The stock is at or fluctuating around a level consistent with ecosystem needs.	There is a high degree of certainty that the stock has been fluctuating around a level consistent with ecosystem needs or has been above this level over recent years.
Met?		(Y/N)	(Y/N)
Overall PI justification	No LTL		
References	N/A		
RBF Required? (✓/×/)	X	Likely PI Scoring Level (<60, 60-79, ≥ 80)	NO SCORE
Stock Status relative to Reference Points			
	Type of reference point	Value of reference point	Current stock status relative to reference point
Reference point used in scoring stock relative to ecosystem impairment (SIa)	[e.g. B _{35%}]	[Include value specifying units. e.g. 50,000t total stock biomass]	[Include current stock status in the same units as the reference point e.g. 90,000/B _{35%} =1.8]
Reference point used in scoring stock relative to ecosystem needs (SIb)	[e.g. B _{75%}]	[Include value specifying units. e.g. 100,000t total stock biomass]	[Include current stock status in the same units as the reference point e.g. 90,000/B _{75%} =0.9]

Evaluation Table for PI 1.1.2 – Stock rebuilding

PI 1.1.2		Where the stock is reduced, there is evidence of stock rebuilding within a specified timeframe		
Scoring Issue		SG 60	SG 80	SG 100
a	Rebuilding timeframes			
	Guidepost	A rebuilding timeframe is specified for the stock that is the shorter of 20 years or 2 times its generation time . For cases where 2 generations is less than 5 years, the rebuilding timeframe is up to 5 years.		The shortest practicable rebuilding timeframe is specified which does not exceed one generation time for the stock.
	Met?	No – there is none but IOTC report indicates that YFT is overfished and subject to overfishing but not the others)		(Y/N)
b	Rebuilding evaluation			
	Guidepost	Monitoring is in place to determine whether the rebuilding strategies are effective in rebuilding the stock within the specified timeframe.	There is evidence that the rebuilding strategies are rebuilding stocks, or it is likely based on simulation modeling, exploitation rates or previous performance that they will be able to rebuild the stock within the specified timeframe.	There is strong evidence that the rebuilding strategies are rebuilding stocks, or it is highly likely based on simulation modeling, exploitation rates or previous performance that they will be able to rebuild the stock within the specified timeframe.
	Met?	(No. None in existence with regard to the YFT But the other species do not need rebuilding)	(Y/N)	(Y/N)
Overall PI justification		There is no stock rebuilding strategy in place but IOTC report indicates that YFT is overfished and subject to overfishing but not the others None in existence with regard to the YFT But the other species do not need rebuilding		
References		IOTC reports		
			Likely PI Scoring Level (<60, 60-79, ≥ 80)	<60

Evaluation Table for PI 1.2.1 – Harvest strategy

PI 1.2.1		There is a robust and precautionary harvest strategy in place		
Scoring Issue		SG 60	SG 80	SG 100
a	Harvest strategy design			
	Guidepost	The harvest strategy is expected to achieve stock management objectives reflected in PI 1.1.1 SG80.	The harvest strategy is responsive to the state of the stock and the elements of the harvest strategy work together towards achieving stock management objectives reflected in PI 1.1.1 SG80.	The harvest strategy is responsive to the state of the stock and is designed to achieve stock management objectives reflected in PI 1.1.1 SG80.
	Met?	None	(Y/N)	(Y/N)
b	Harvest strategy evaluation			
	Guidepost	The harvest strategy is likely to work based on prior experience or plausible argument.	The harvest strategy may not have been fully tested but evidence exists that it is achieving its objectives.	The performance of the harvest strategy has been fully evaluated and evidence exists to show that it is achieving its objectives including being clearly able to maintain stocks at target levels.
	Met?	(N)	(Y/N)	(Y/N)
c	Harvest strategy monitoring			
	Guidepost	Monitoring is in place that is expected to determine whether the harvest strategy is working.		
	Met?	(N)		
d	Harvest strategy review			
	Guidepost			The harvest strategy is periodically reviewed and improved as necessary.
	Met?			(N)
e	Shark finning			
	Guidepost	It is likely that shark finning is not taking place.	It is highly likely that shark finning is not taking place.	There is a high degree of certainty that shark finning is not taking place.
	Met?	(Y)	(Y/N/Not relevant)	(Y/N/Not relevant)
f	Review of alternative measures			
	Guidepost	There has been a review of the potential effectiveness and practicality of	There is a regular review of the potential effectiveness and practicality of	There is a biennial review of the potential effectiveness and practicality of alternative

PI 1.2.1		There is a robust and precautionary harvest strategy in place		
		alternative measures to minimize UoA-related mortality of unwanted catch of the target stock.	alternative measures to minimize UoA-related mortality of unwanted catch of the target stock and they are implemented as appropriate.	measures to minimize UoA-related mortality of unwanted catch of the target stock, and they are implemented, as appropriate.
	Met?	None	(Y/N/Not relevant)	(Y/N/Not relevant)
Overall PI justification		No harvest strategy in place for precautionary purposes and no shark finning		
References		IOTC report 2017		
			Likely PI Scoring Level (<60, 60-79, ≥ 80)	<60

Evaluation Table for PI 1.2.2 – Harvest control rules and tools

PI 1.2.2		There are well defined and effective harvest control rules (HCRs) in place		
Scoring Issue		SG 60	SG 80	SG 100
a	HCRs design and application			
	Guidepost	Generally understood HCRs are in place or available that are expected to reduce the exploitation rate as the point of recruitment impairment (PRI) is approached.	Well defined HCRs are in place that ensure that the exploitation rate is reduced as the PRI is approached, are expected to keep the stock fluctuating around a target level consistent with (or above) MSY, or for key LTL species a level consistent with ecosystem needs.	The HCRs are expected to keep the stock fluctuating at or above a target level consistent with MSY, or another more appropriate level taking into account the ecological role of the stock, most of the time.
	Met?	Yes harvest rules are generally understood.	(Y/N)	
b	HCRs robustness to uncertainty			
	Guidepost		The HCRs are likely to be robust to the main uncertainties.	The HCRs take account of a wide range of uncertainties including the ecological role of the stock, and there is evidence that the HCRs are robust to the main uncertainties.
	Met?		No	(Y/N)
c	HCRs evaluation			
	Guidepost	There is some evidence that tools used or available to implement HCRs are appropriate and	Available evidence indicates that the tools in use are appropriate and effective in achieving the	Evidence clearly shows that the tools in use are effective in achieving the

PI 1.2.2	There are well defined and effective harvest control rules (HCRs) in place		
	effective in controlling exploitation.	exploitation levels required under the HCRs.	exploitation levels required under the HCRs.
Met?	Yes	(Y/N)	(Y/N)
Overall PI justification	No detailed harvest strategy in place Evidence of tools used to implement HCRs are effective in controlling exploitation		
References	IOTC reports; Polacheck 2007; Hampton 2000		
		Likely PI Scoring Level (<60, 60-79, ≥ 80)	<60

Evaluation Table for PI 1.2.3 – Information and monitoring

PI 1.2.3	Relevant information is collected to support the harvest strategy		
Scoring Issue	SG 60	SG 80	SG 100
a	Range of information		
Guidepost	Some relevant information related to stock structure, stock productivity and fleet composition is available to support the harvest strategy.	Sufficient relevant information related to stock structure, stock productivity, fleet composition and other data is available to support the harvest strategy.	A comprehensive range of information (on stock structure, stock productivity, fleet composition, stock abundance, UoA removals and other information such as environmental information), including some that may not be directly related to the current harvest strategy, is available.
Met?	Yes, there is some information on fleet composition, IOTC reports	(Y/N)	(Y/N)
b	Monitoring		
Guidepost	Stock abundance and UoA removals are monitored and at least one indicator is available and monitored with sufficient frequency to support the harvest control rule.	Stock abundance and UoA removals are regularly monitored at a level of accuracy and coverage consistent with the harvest control rule , and one or more indicators are available and monitored with sufficient frequency to support the harvest control rule.	All information required by the harvest control rule is monitored with high frequency and a high degree of certainty, and there is a good understanding of inherent uncertainties in the information [data] and the robustness of assessment and management to this uncertainty.
Met?	No	(Y/N)	(Y/N)
c	Comprehensiveness of information		

PI 1.2.3	Relevant information is collected to support the harvest strategy		
Guidepost		There is good information on all other fishery removals from the stock.	
Met?		No	
Overall PI justification	Limited monitoring and research done on UOA There is some information on fleet composition, IOTC reports		
References	Bromhead et al., 2003; IOTC reports; Fonteneau, 2003		
		Likely PI Scoring Level (<60, 60-79, ≥ 80)	<60

Evaluation Table for PI 1.2.4 – Assessment of stock status

PI 1.2.4	There is an adequate assessment of the stock status		
Scoring Issue	SG 60	SG 80	SG 100
a	Appropriateness of assessment to stock under consideration		
Guidepost		The assessment is appropriate for the stock and for the harvest control rule.	The assessment takes into account the major features relevant to the biology of the species and the nature of the UoA.
Met?		Yes, IOTC	(Y/N)
b	Assessment approach		
Guidepost	The assessment estimates stock status relative to generic reference points appropriate to the species category.	The assessment estimates stock status relative to reference points that are appropriate to the stock and can be estimated.	
Met?	(Y/N)	Yes, IOTC	
c	Uncertainty in the assessment		
Guidepost	The assessment identifies major sources of uncertainty.	The assessment takes uncertainty into account.	The assessment takes into account uncertainty and is evaluating stock status relative to reference points in a probabilistic way.
Met?	Yes, IOTC report	(Y/N)	(Y/N)
d	Evaluation of assessment		
Guidepost			The assessment has been tested and shown to be robust. Alternative hypotheses and assessment approaches have been rigorously explored.
Met?			Yes
e	Peer review of assessment		
Guidepost		The assessment of stock status is subject to peer review.	The assessment has been internally and externally peer reviewed.
Met?		(Y/N)	Yes

PI 1.2.4	There is an adequate assessment of the stock status		
Overall PI justification	Stock assessments are generally conducted and sources of uncertainty determined and are reviewed		
References	IOTC reports		
	Likely PI Scoring Level (<60, 60-79, ≥ 80)	60-79	

Principle 2 Maintenance of the fishery ecosystem

Katsuwonis pelamis, *Scomberomorus commerson*, *Xiphias gladius*, *Acanthocybium solandri* & *Coryphaena hippurus*

Evaluation Table for PI 2.1.1 – Primary species outcome

PI 2.1.1	The UoA aims to maintain primary species above the PRI and does not hinder recovery of primary species if they are below the PRI.		
Scoring Issue	SG 60	SG 80	SG 100
a	Main primary species stock status		
	Guidepost	Main primary species are likely to be above the PRI OR If the species is below the PRI, the UoA has measures in place that are expected to ensure that the UoA does not hinder recovery and rebuilding.	Main primary species are highly likely to be above the PRI OR If the species is below the PRI, there is either evidence of recovery or a demonstrably effective strategy in place between all MSC UoAs which categorize this species as main , to ensure that they collectively do not hinder recovery and rebuilding.
	Met? NB: varies by species	Others: Info/data is inadequate to estimate stock status. Shark species are likely below (Kiilu, Odennyo thesis)	<i>K. pelamis</i>: refer to IOTC report (2018)
b	Minor primary species stock status		
	Guidepost		Minor primary species are highly likely to be above the PRI OR If below the PRI, there is evidence that the UoA does not hinder the recovery and rebuilding of minor primary species
	Met?		Not relevant
Overall PI justification	Info/data is inadequate to estimate stock status. Shark species are likely below and the information vary by species		

PI 2.1.1	The UoA aims to maintain primary species above the PRI and does not hinder recovery of primary species if they are below the PRI.		
References	Kiilu, Odennyo thesis; IOTC reports		
RBF Required? (✓/✗/)	✓ RBF Required	Likely PI Scoring Level (<60, 60-79, ≥ 80)	<60

Evaluation Table for PI 2.1.2 – Primary species management strategy

PI 2.1.2	There is a strategy in place that is designed to maintain or to not hinder rebuilding of primary species, and the UoA regularly reviews and implements measures, as appropriate, to minimize the mortality of unwanted catch.		
Scoring Issue	SG 60	SG 80	SG 100
a	Management strategy in place		
Guidepost	There are measures in place for the UoA, if necessary, that are expected to maintain or to not hinder rebuilding of the main primary species at/to levels which are likely to above the point where recruitment would be impaired.	There is a partial strategy in place for the UoA, if necessary, that is expected to maintain or to not hinder rebuilding of the main primary species at/to levels which are highly likely to be above the point where recruitment would be impaired.	There is a strategy in place for the UoA for managing main and minor primary species.
Met?	No measures in place	(Y/N)	(Y/N)
b	Management strategy evaluation		
Guidepost	The measures are considered likely to work, based on plausible argument (e.g., general experience, theory or comparison with similar fisheries/species).	There is some objective basis for confidence that the measures/partial strategy will work, based on some information directly about the fishery and/or species involved.	Testing supports high confidence that the partial strategy/strategy will work, based on information directly about the fishery and/or species involved.
Met?	No measures in place	(Y/N)	(Y/N)
c	Management strategy implementation		
Guidepost		There is some evidence that the measures/partial strategy is being implemented successfully .	There is clear evidence that the partial strategy/strategy is being implemented successfully and is achieving its overall objective as set out in scoring issue (a).
Met?		No measures in place	(Y/N)
d	Shark finning		
Guidepost	It is likely that shark finning is not taking place.	It is highly likely that shark finning is not taking place.	There is a high degree of certainty that shark finning is not taking place.

PI 2.1.2		There is a strategy in place that is designed to maintain or to not hinder rebuilding of primary species, and the UoA regularly reviews and implements measures, as appropriate, to minimize the mortality of unwanted catch.		
	Met?	Yes, sharks are eaten so not likely to be finned and discarded in this fishery	(Y/N/Not relevant)	(Y/N/Not relevant)
e	Review of alternative measures			
	Guidepost	There is a review of the potential effectiveness and practicality of alternative measures to minimize UoA-related mortality of unwanted catch of main primary species.	There is a regular review of the potential effectiveness and practicality of alternative measures to minimize UoA-related mortality of unwanted catch of main primary species and they are implemented as appropriate.	There is a biennial review of the potential effectiveness and practicality of alternative measures to minimize UoA-related mortality of unwanted catch of all primary species, and they are implemented, as appropriate.
	Met?	No strategy in place	(Y/N/Not relevant)	(Y/N/Not relevant)
Overall PI justification		No management strategy in place Shark finning likelihood available		
References		IOTC reports		
			Likely PI Scoring Level (<60, 60-79, ≥ 80)	<60

Evaluation Table for PI 2.1.3 – Primary species information

PI 2.1.3		Information on the nature and extent of primary species is adequate to determine the risk posed by the UoA and the effectiveness of the strategy to manage primary species		
Scoring Issue		SG 60	SG 80	SG 100
a	Information adequacy for assessment of impact on main primary species			
	Guidepost	Qualitative information is adequate to estimate the impact of the UoA on the main primary species with respect to status. OR If RBF is used to score PI 2.1.1 for the UoA: Qualitative information is adequate to estimate productivity and susceptibility attributes for main primary species.	Some quantitative information is available and is adequate to assess the impact of the UoA on the main primary species with respect to status. OR If RBF is used to score PI 2.1.1 for the UoA: Some quantitative information is adequate to assess productivity and susceptibility attributes for main primary species.	Quantitative information is available and is adequate to assess with a high degree of certainty the impact of the UoA on main primary species with respect to status.

PI 2.1.3		Information on the nature and extent of primary species is adequate to determine the risk posed by the UoA and the effectiveness of the strategy to manage primary species		
	Met?	Yes, some information is available on species and size composition	(Y/N)	(Y/N)
b	Information adequacy for assessment of impact on minor primary species			
	Guidepost			Some quantitative information is adequate to estimate the impact of the UoA on minor primary species with respect to status.
	Met?			Not relevant (no minor primary species)
c	Information adequacy for management strategy			
	Guidepost	Information is adequate to support measures to manage main primary species.	Information is adequate to support a partial strategy to manage main Primary species.	Information is adequate to support a strategy to manage all primary species, and evaluate with a high degree of certainty whether the strategy is achieving its objective.
	Met?	Not adequate	(Y/N)	(Y/N)
Overall PI justification		some information is available on species and size composition Information available is not adequate		
References		IOTC reports; fleet data		
			Likely PI Scoring Level (<60, 60-79, ≥ 80)	<60

Evaluation Table for PI 2.2.1 – Secondary species outcome

PI 2.2.1		The UoA aims to maintain secondary species above a biologically based limit and does not hinder recovery of secondary species if they are below a biological based limit.		
Scoring Issue		SG 60	SG 80	SG 100
a	Main secondary species stock status			
	Guidepost	Main Secondary species are likely to be within biologically based limits. OR If below biologically based limits, there are measures in place expected to ensure that the UoA does not hinder recovery and rebuilding.	Main secondary species are highly likely to be above biologically based limits OR If below biologically based limits, there is either evidence of recovery or a demonstrably effective partial strategy in place such that the UoA does not hinder recovery and rebuilding.	There is a high degree of certainty that main secondary species are within biologically based limits.

PI 2.2.1		The UoA aims to maintain secondary species above a biologically based limit and does not hinder recovery of secondary species if they are below a biological based limit.		
			AND Where catches of a main secondary species outside of biological limits are considerable, there is either evidence of recovery or a, demonstrably effective strategy in place between those MSC UoAs that also have considerable catches of the species, to ensure that they collectively do not hinder recovery and rebuilding.	
	Met?	Information is inadequate, although it is likely that most sharks and rays are below PRI based on their biological characteristics and fishing effort	(Y/N)	(Y/N)
b	Minor secondary species stock status			
	Guidepost			Minor secondary species are highly likely to be above biologically based limits. OR If below biologically based limits', there is evidence that the UoA does not hinder the recovery and rebuilding of secondary species
	Met?			Not relevant
Overall PI justification		Information is inadequate, although it is likely that most sharks and rays are below PRI based on their biological characteristics and fishing effort No minor secondary species identified in the fishery		
References		IOTC reports 2017		
RBF Required? (✓/✗/)		X	Likely PI Scoring Level (<60, 60-79, ≥ 80)	<60

Evaluation Table for PI 2.2.2 – Secondary species management strategy

PI 2.2.2	There is a strategy in place for managing secondary species that is designed to maintain or to not hinder rebuilding of secondary species and the UoA regularly reviews and implements measures, as appropriate, to minimize the mortality of unwanted catch.		
Scoring Issue	SG 60	SG 80	SG 100
a	Management strategy in place		
Guidepost	There are measures in place, if necessary, which are expected to maintain or not hinder rebuilding of main secondary species at/to levels which are highly likely to be within biologically based limits or to ensure that the UoA does not hinder their recovery.	There is a partial strategy in place, if necessary, for the UoA that is expected to maintain or not hinder rebuilding of main secondary species at/to levels which are highly likely to be within biologically based limits or to ensure that the UoA does not hinder their recovery.	There is a strategy in place for the UoA for managing main and minor secondary species.
Met?	Yes, IOTC, Wildlife Act, Fisheries Act as well as other international legislations e.g. CITES	(Y/N)	(Y/N)
b	Management strategy evaluation		
Guidepost	The measures are considered likely to work, based on plausible argument (e.g. general experience, theory or comparison with similar UoAs/species).	There is some objective basis for confidence that the measures/partial strategy will work, based on some information directly about the UoA and/or species involved.	Testing supports high confidence that the partial strategy/strategy will work, based on information directly about the UoA and/or species involved.
Met?	Yes	(Y/N)	(Y/N)
c	Management strategy implementation		
Guidepost		There is some evidence that the measures/partial strategy is being implemented successfully .	There is clear evidence that the partial strategy/strategy is being implemented successfully and is achieving its objective as set out in scoring issue (a).
Met?		Yes, Compliance reporting to IOTC, NPOA development	(Y/N)
d	Shark finning		
Guidepost	It is likely that shark finning is not taking place.	It is highly likely that shark finning is not taking place.	There is a high degree of certainty that shark finning is not taking place.

PI 2.2.2	There is a strategy in place for managing secondary species that is designed to maintain or to not hinder rebuilding of secondary species and the UoA regularly reviews and implements measures, as appropriate, to minimize the mortality of unwanted catch.		
	Met?	Yes	(Y/N/Not relevant)
e	Review of alternative measures to minimize mortality of unwanted catch [Scoring issue need not be scored if are no unwanted catches of secondary species]		
	Guidepost	There is a review of the potential effectiveness and practicality of alternative measures to minimize UoA-related mortality of unwanted catch of main secondary species.	There is a regular review of the potential effectiveness and practicality of alternative measures to minimize UoA-related mortality of unwanted catch of main secondary species and they are implemented as appropriate.
	Met?	Not relevant	(Y/N/Not relevant)
Overall PI justification	Secondary species management strategies; IOTC, Wildlife Act, Fisheries Act as well as other international legislations e.g. CITES Compliance reporting to IOTC, NPOA development Shark finning unlikely to take place		
References	IOTC reports, Wildlife Act, Fisheries Act, CITES		
	Likely PI Scoring Level (<60, 60-79, ≥ 80)		60-79

Evaluation Table for PI 2.2.3 – Secondary species information

PI 2.2.3	Information on the nature and amount of secondary species taken is adequate to determine the risk posed by the UoA and the effectiveness of the strategy to manage secondary species.		
Scoring Issue	SG 60	SG 80	SG 100
a	Information adequacy for assessment of impacts on main secondary species		
Guidepost	Qualitative information is adequate to estimate the impact of the UoA on the main secondary species with respect to status. OR If RBF is used to score PI 2.2.1 for the UoA: Qualitative information is adequate to estimate productivity and	Some quantitative information is available and adequate to assess the impact of the UoA on main secondary species with respect to status. OR If RBF is used to score PI 2.2.1 for the UoA: Some quantitative information is adequate to assess productivity and susceptibility attributes for main secondary species.	Quantitative information is available and adequate to assess with a high degree of certainty the impact of the UoA on main secondary species with respect to status.

PI 2.2.3		Information on the nature and amount of secondary species taken is adequate to determine the risk posed by the UoA and the effectiveness of the strategy to manage secondary species.		
		susceptibility attributes for main secondary species.		
	Met?	Yes, RBF done by IOTC	(Y/N)	(Y/N)
b Information adequacy for assessment of impacts on minor secondary species				
	Guidepost			Some quantitative information is adequate to estimate the impact of the UoA on minor secondary species with respect to status.
	Met?			Not relevant
c Information adequacy for management strategy				
	Guidepost	Information is adequate to support measures to manage main secondary species.	Information is adequate to support a partial strategy to manage main secondary species.	Information is adequate to support a strategy to manage all secondary species, and evaluate with a high degree of certainty whether the strategy is achieving its objective .
	Met?	No	(Y/N)	(Y/N)
Overall PI justification		RBF done by IOTC Information to support measures for main secondary species is lacking		
References		IOTC reports		
			Likely PI Scoring Level (<60, 60-79, ≥ 80)	<60

Evaluation Table for PI 2.3.1 – ETP species outcome

PI 2.3.1		The UoA meets national and international requirements for the protection of ETP species The UoA does not hinder recovery of ETP species		
Scoring Issue		SG 60	SG 80	SG 100
a	Effects of the UoA on population/stock within national or international limits, where applicable [Scoring issue need not be scored if there are no national or international requirements that set limits for ETP species].			
	Guidepost	Where national and/or international requirements set limits for ETP species, the effects of the UoA on the population/stock are known and likely to be within these limits.	Where national and/or international requirements set limits for ETP species, the combined effects of the MSC UoAs on the population/stock are known and highly likely to be within these limits.	Where national and/or international requirements set limits for ETP species, there is a high degree of certainty that the combined effects of the MSC UoAs are within these limits.

PI 2.3.1		<p>The UoA meets national and international requirements for the protection of ETP species</p> <p>The UoA does not hinder recovery of ETP species</p>		
	Met?	Effects of the UoA on the population/stock are known and likely to be within these limits are unknown	(Y/N/Not relevant)	(Y/N/Not relevant)
b	Direct effects			
	Guidepost	Known direct effects of the UoA are likely to not hinder recovery of ETP species.	Known direct effects of the UoA are highly likely to not hinder recovery of ETP species.	There is a high degree of confidence that there are no significant detrimental direct effects of the UoA on ETP species.
	Met?	Effects are unknown	(Y/N)	(Y/N)
c	Indirect effects			
	Guidepost		Indirect effects have been considered and are thought to be highly likely to not create unacceptable impacts.	There is a high degree of confidence that there are no significant detrimental indirect effects of the fishery on ETP species.
	Met?		Effects are unknown	(Y/N)
Overall PI justification		Effects are unknown Scanty information on this More research needs to be done		
References		IOTC reports 2017		
RBF Required? (✓/×/)		X	Likely PI Scoring Level (<60, 60-79,)	<60

Evaluation Table for PI 2.3.2 – ETP species management strategy

PI 2.3.2		<p>The UoA has in place precautionary management strategies designed to:</p> <ul style="list-style-type: none"> • meet national and international requirements; • Ensure the UoA does not hinder recovery of ETP species. <p>Also, the UoA regularly reviews and implements measures, as appropriate, to minimize the mortality of ETP species.</p>		
Scoring Issue		SG 60	SG 80	SG 100
a	Management strategy in place (national and international requirements) [Scoring issue need not be scored if <u>there are no</u> requirements for protection or rebuilding provided through national ETP legislation or international agreements].			
	Guidepost	There are measures in place that minimize the UoA-related mortality of ETP species, and are expected to be highly likely to achieve national and international requirements for the	There is a strategy in place for managing the UoA’s impact on ETP species, including measures to minimize mortality, which is designed to be highly likely to achieve national and international	There is a comprehensive strategy in place for managing the UoA’s impact on ETP species, including measures to minimize mortality, which is designed to achieve above national and international requirements

<p>PI 2.3.2</p>	<p>The UoA has in place precautionary management strategies designed to:</p> <ul style="list-style-type: none"> • meet national and international requirements; • Ensure the UoA does not hinder recovery of ETP species. <p>Also, the UoA regularly reviews and implements measures, as appropriate, to minimize the mortality of ETP species.</p>			
		<p>protection of ETP species.</p>	<p>requirements for the protection of ETP species.</p>	<p>for the protection of ETP species.</p>
	<p>Met?</p>	<p>Yes, general measures not specific to the UOA (national legislation) MPAs</p>	<p>(Y/N/Not relevant)</p>	<p>(Y/N/Not relevant)</p>
<p>b</p>	<p>Management strategy in place (alternative)</p>			
	<p>[Scoring issue need not be scored if there are requirements for protection or rebuilding provided through national ETP legislation or international agreements].</p>			
	<p>Guidepost</p>	<p>There are measures in place that are expected to ensure the UoA does not hinder the recovery of ETP species.</p>	<p>There is a strategy in place that is expected to ensure the UoA does not hinder the recovery of ETP species.</p>	<p>There is a comprehensive strategy in place for managing ETP species, to ensure the UoA does not hinder the recovery of ETP species</p>
	<p>Met?</p>	<p>(Y/N/Not relevant)</p>	<p>(Y/N/Not relevant)</p>	<p>YES, comprehensive measures are in place: - - sea turtle strategy - Sea turtle Action plan - Wildlife Act, on ETPs - Fisheries Act - IPOAs etc.</p>
<p>c</p>	<p>Management strategy evaluation</p>			
	<p>Guidepost</p>	<p>The measures are considered likely to work, based on plausible argument (e.g. general experience, theory or comparison with similar fisheries/species).</p>	<p>There is an objective basis for confidence that the measures/strategy will work, based on information directly about the fishery and/or the species involved.</p>	<p>The strategy/comprehensive strategy is mainly based on information directly about the fishery and/or species involved, and a quantitative analysis supports high confidence that the strategy will work.</p>
	<p>Met?</p>	<p>Yes the existing legislative structures will work based on information from other fisheries such as the trawls, purse seines and other fisheries etc</p>	<p>(Y/N)</p>	<p>(Y/N)</p>
<p>d</p>	<p>Management strategy implementation</p>			
	<p>Guidepost</p>		<p>There is some evidence that the measures/strategy</p>	<p>There is clear evidence that the strategy/comprehensive</p>

<p>PI 2.3.2</p>	<p>The UoA has in place precautionary management strategies designed to:</p> <ul style="list-style-type: none"> • meet national and international requirements; • Ensure the UoA does not hinder recovery of ETP species. <p>Also, the UoA regularly reviews and implements measures, as appropriate, to minimize the mortality of ETP species.</p>			
			<p>is being implemented successfully.</p>	<p>strategy is being implemented successfully and is achieving its objective as set out in scoring issue (a) or (b).</p>
	<p>Met?</p>		<p>NO, no evidence available for measures being implemented specific to the fishery</p>	<p>(Y/N)</p>
<p>e</p>	<p>Review of alternative measures to minimize mortality of ETP species</p>			
	<p>Guidepost</p>	<p>There is a review of the potential effectiveness and practicality of alternative measures to minimize UoA-related mortality of ETP species.</p>	<p>There is a regular review of the potential effectiveness and practicality of alternative measures to minimize UoA-related mortality of ETP species and they are implemented as appropriate.</p>	<p>There is a biennial review of the potential effectiveness and practicality of alternative measures to minimize UoA-related mortality ETP species, and they are implemented, as appropriate.</p>
	<p>Met?</p>	<p>No structured review of the UOA related ETP mortalities</p>	<p>(Y/N)</p>	<p>(Y/N)</p>
<p>Overall PI justification</p>	<p>General fisheries regulations are in place within the Fisheries Act, some are proposed in the Ring net management plan, however, fishery specific measures have not been put in place. Comprehensive measures are in place: - - sea turtle strategy - Sea turtle Action plan - Wildlife Act, on ETPs - Fisheries Act - IPOAs etc. The existing legislative structures will work based on information from other fisheries such as the trawls, purse seines and other fisheries etc General measures not specific to the UOA (national legislation) MPAs No evidence that measures are being implemented successfully No structured review of the UOA related ETP mortalities</p>			
<p>References</p>	<p>IOTC reports; Wildlife act; Fisheries management and Development Act</p>			

<p>Likely PI Scoring Level (<60, 60-79, ≥ 80)</p>	<p><60</p>
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Evaluation Table for PI 2.3.3 – ETP species information

PI 2.3.3	Relevant information is collected to support the management of UoA impacts on ETP species, including: <ul style="list-style-type: none"> Information for the development of the management strategy; Information to assess the effectiveness of the management strategy; and Information to determine the outcome status of ETP species. 		
Scoring Issue	SG 60	SG 80	SG 100
a	Information adequacy for assessment of impacts		
Guidepost	Qualitative information is adequate to estimate the UoA related mortality on ETP species. OR If RBF is used to score PI 2.3.1 for the UoA: Qualitative information is adequate to estimate productivity and susceptibility attributes for ETP species.	Some quantitative information is adequate to assess the UoA related mortality and impact and to determine whether the UoA may be a threat to protection and recovery of the ETP species. OR If RBF is used to score PI 2.3.1 for the UoA: Some quantitative information is adequate to assess productivity and susceptibility attributes for ETP species.	Quantitative information is available to assess with a high degree of certainty the magnitude of UoA-related impacts, mortalities and injuries and the consequences for the status of ETP species.
Met?	Information is not adequate	(Y/N)	(Y/N)
b	Information adequacy for management strategy		
Guidepost	Information is adequate to support measures to manage the impacts on ETP species.	Information is adequate to measure trends and supports a strategy to manage impacts on ETP species.	Information is adequate to support a comprehensive strategy to manage impacts, minimize mortality and injury of ETP species, and evaluate with a high degree of certainty whether a strategy is achieving its objectives.
Met?	Information is not adequate	(Y/N)	(Y/N)
Overall PI justification	Information is not adequate for assessment and for supporting measures to manage impacts on ETPs		
References	Sea turtle strategy Sea turtle Action plan Kenya Wildlife Act, on ETPs Fisheries Management and Development Act of 2016 IPOAs		
	Likely PI Scoring Level (<60, 60-79, ≥ 80)		<60

Evaluation Table for PI 2.4.1 – Habitats outcome (open waters)

PI 2.4.1	The UoA does not cause serious or irreversible harm to habitat structure and function, considered on the basis of the area covered by the governance body(s) responsible for fisheries management in the area(s) where the UoA operates.		
Scoring Issue	SG 60	SG 80	SG 100
a	Commonly encountered habitat status		
Guidepost	The UoA is unlikely to reduce structure and function of the commonly encountered habitats to a point where there would be serious or irreversible harm.	The UoA is highly unlikely to reduce structure and function of the commonly encountered habitats to a point where there would be serious or irreversible harm.	There is evidence that the UoA is highly unlikely to reduce structure and function of the commonly encountered habitats to a point where there would be serious or irreversible harm.
Met?	(Y/N)	The UoA operates in pelagic waters and is thus highly unlikely to negatively impact any encountered habitat	(Y/N)
b	VME habitat status [Scoring issue need not be scored if there are no VMEs].		
Guidepost	The UoA is unlikely to reduce structure and function of the VME habitats to a point where there would be serious or irreversible harm.	The UoA is highly unlikely to reduce structure and function of the VME habitats to a point where there would be serious or irreversible harm.	There is evidence that the UoA is highly unlikely to reduce structure and function of the VME habitats to a point where there would be serious or irreversible harm.
Met?	(Y/N/Not relevant)	The UoA operates in pelagic waters and is thus highly unlikely to negatively impact any encountered habitat	(Y/N/Not relevant)
c	Minor habitat status		
Guidepost			There is evidence that the UoA is highly unlikely to reduce structure and function of the minor habitats to a point where there would be serious or irreversible harm.
Met?			There is indirect knowledge (expert and anecdotal) based on the gear deployment, but quantitative information is lacking.
Overall PI justification	The UoA operates in pelagic waters and is thus highly unlikely to negatively impact any encountered habitat		

PI 2.4.1	The UoA does not cause serious or irreversible harm to habitat structure and function, considered on the basis of the area covered by the governance body(s) responsible for fisheries management in the area(s) where the UoA operates.		
	There is indirect knowledge (expert and anecdotal) based on the gear deployment, but quantitative information is lacking		
References	IOTC reports		
RBF Required? (✓/×/)	✓ RBF Required	Likely PI Scoring Level (<60, 60-79, ≥ 80)	60-79

Evaluation Table for PI 2.4.2 – Habitats management strategy

PI 2.4.2	There is a strategy in place that is designed to ensure the UoA does not pose a risk of serious or irreversible harm to the habitats.		
Scoring Issue	SG 60	SG 80	SG 100
a	Management strategy in place		
Guidepost	There are measures in place, if necessary, that are expected to achieve the Habitat Outcome 80 level of performance.	There is a partial strategy in place, if necessary, that is expected to achieve the Habitat Outcome 80 level of performance or above.	There is a strategy in place for managing the impact of all MSC UoAs/non-MSC fisheries on habitats.
Met?	Not relevant	(Y/N)	(Y/N)
b	Management strategy evaluation		
Guidepost	The measures are considered likely to work, based on plausible argument (e.g. general experience, theory or comparison with similar UoAs/habitats).	There is some objective basis for confidence that the measures/partial strategy will work, based on information directly about the UoA and/or habitats involved.	Testing supports high confidence that the partial strategy/strategy will work, based on information directly about the UoA and/or habitats involved.
Met?	Not relevant	(Y/N)	(Y/N)
c	Management strategy implementation		
Guidepost		There is some quantitative evidence that the measures/partial strategy is being implemented successfully.	There is clear quantitative evidence that the partial strategy/strategy is being implemented successfully and is achieving its objective, as outlined in scoring issue (a).
Met?		Not relevant	(Y/N)
d	Compliance with management requirements and other MSC UoAs'/non-MSC fisheries' measures to protect VMEs [Scoring issue need not be scored if there are no VMEs].		
Guidepost	There is qualitative evidence that the UoA complies with its management requirements to protect VMEs.	There is some quantitative evidence that the UoA complies with both its management requirements and with protection measures afforded to VMEs by other MSC	There is clear quantitative evidence that the UoA complies with both its management requirements and with protection measures afforded to VMEs by other MSC

PI 2.4.2	There is a strategy in place that is designed to ensure the UoA does not pose a risk of serious or irreversible harm to the habitats.			
			UoAs/non-MSC fisheries, where relevant.	UoAs/non-MSC fisheries, where relevant.
	Met?	Not relevant, based on the gear operation	(Y/N/Not relevant)	(Y/N/Not relevant)
Overall PI justification	No habitat management strategy			
References	[List any references here]			
			Likely PI Scoring Level (<60, 60-79, ≥ 80)	NOT RELEVANT

Evaluation Table for PI 2.4.3 – Habitats information

PI 2.4.3	Information is adequate to determine the risk posed to the habitat by the UoA and the effectiveness of the strategy to manage impacts on the habitat.			
Scoring Issue	SG 60	SG 80	SG 100	
a	Information quality			
	Guidepost	The types and distribution of the main habitats are broadly understood. OR If CSA is used to score PI 2.4.1 for the UoA: Qualitative information is adequate to estimate the types and distribution of the main habitats.	The nature, distribution and vulnerability of the main habitats in the UoA area are known at a level of detail relevant to the scale and intensity of the UoA. OR If CSA is used to score PI 2.4.1 for the UoA: Some quantitative information is available and is adequate to estimate the types and distribution of the main habitats.	The distribution of all habitats is known over their range, with particular attention to the occurrence of vulnerable habitats.
	Met?	YES, habitat distribution broadly understood, some mapping done	(Y/N)	
b	Information adequacy for assessment of impacts			
	Guidepost	Information is adequate to broadly understand the nature of the main impacts of gear use on the main habitats, including spatial overlap of	Information is adequate to allow for identification of the main impacts of the UoA on the main habitats, and there is reliable information on the spatial extent of interaction and	The physical impacts of the gear on all habitats have been quantified fully.

PI 2.4.3		Information is adequate to determine the risk posed to the habitat by the UoA and the effectiveness of the strategy to manage impacts on the habitat.		
		habitat with fishing gear. OR If CSA is used to score PI 2.4.1 for the UoA: Qualitative information is adequate to estimate the consequence and spatial attributes of the main habitats.	on the timing and location of use of the fishing gear. OR If CSA is used to score PI 2.4.1 for the UoA: Some quantitative information is available and is adequate to estimate the consequence and spatial attributes of the main habitats.	
	Met?	There is adequate qualitative information	(Y/N)	(Y/N)
c	Monitoring			
	Guidepost		Adequate information continues to be collected to detect any increase in risk to the main habitats.	Changes in habitat distributions over time are measured.
	Met?		Yes, although no monitoring currently on going. Previous studies on habitats conducted, overlap maps of the fishery undertaken	(Y/N)
Overall PI justification		Habitat distribution broadly understood, some mapping done habitat distribution broadly understood, some mapping done Ref: Thoya et al Although no monitoring currently on going. Previous studies on habitats conducted, overlap maps of the fishery undertaken		
References		Thoya et al , KMFRI Biodiversity reports; Painter, Cortes and Engels, 2001		
			Likely PI Scoring Level (<60, 60-79, ≥ 80)	60-79

Evaluation Table for PI 2.5.1 – Ecosystem outcome

PI 2.5.1		The UoA does not cause serious or irreversible harm to the key elements of ecosystem structure and function.		
Scoring Issue		SG 60	SG 80	SG 100
a	Ecosystem status			
	Guidepost	The UoA is unlikely to disrupt the key elements underlying ecosystem structure and function to a point where there would be a serious or irreversible harm.	The UoA is highly unlikely to disrupt the key elements underlying ecosystem structure and function to a point where there would be a serious or irreversible harm.	There is evidence that the UoA is highly unlikely to disrupt the key elements underlying ecosystem structure and function to a point where there would be a serious or irreversible harm.

PI 2.5.1	The UoA does not cause serious or irreversible harm to the key elements of ecosystem structure and function.		
Met?	(Y/N/Partial)	Yes, scale of the fishery is Kenya is very small	(Y/N/Partial)
Overall PI justification	Yes, scale of the fishery is Kenya is very small		
References	KMFRI Biodiversity reports		
RBF Required? (✓/✗/)	X	Likely PI Scoring Level (<60, 60-79, ≥ 80)	≥ 80

Evaluation Table for PI 2.5.2 – Ecosystem management strategy

PI 2.5.2	There are measures in place to ensure the UoA does not pose a risk of serious or irreversible harm to ecosystem structure and function.		
Scoring Issue	SG 60	SG 80	SG 100
a	Management strategy in place		
Guidepost	There are measures in place, if necessary which take into account the potential impacts of the fishery on key elements of the ecosystem.	There is a partial strategy in place, if necessary, which takes into account available information and is expected to restrain impacts of the UoA on the ecosystem so as to achieve the Ecosystem Outcome 80 level of performance.	There is a strategy that consists of a plan , in place which contains measures to address all main impacts of the UoA on the ecosystem, and at least some of these measures are in place.
Met?	Yes, Kenya Tuna Fisheries Development and Management Strategy 2013-2018, General fisheries regulations	(Y/N)	(Y/N)
b	Management strategy evaluation		
Guidepost	The measures are considered likely to work, based on plausible argument (e.g., general experience, theory or comparison with similar fisheries/ ecosystems).	There is some objective basis for confidence that the measures/partial strategy will work, based on some information directly about the UoA and/or the ecosystem involved	Testing supports high confidence that the partial strategy/strategy will work, based on information directly about the UoA and/or ecosystem involved
Met?	Yes	(Y/N)	(Y/N)
c	Management strategy implementation		
Guidepost		There is some evidence that the measures/partial strategy is being implemented successfully .	There is clear evidence that the partial strategy/strategy is being implemented successfully and is achieving its objective as set out in scoring issue (a) .
Met?		Yes, National tuna dialogue meeting reports	(Y/N)

PI 2.5.2	There are measures in place to ensure the UoA does not pose a risk of serious or irreversible harm to ecosystem structure and function.		
Overall PI justification	There are measures to ensure the Fishery does not pose irreversible harm to ecosystem structure and function; the Kenya Tuna Fisheries Development and Management Strategy 2013-2018, General fisheries regulations Measures are considered likely to work, based on plausible argument National tuna dialogue meeting reports show partial measures		
References	Kenya Tuna Fisheries Development and Management Strategy 2013-2018; IOTC reports; Fisheries Management and Development Act 2016		
		Likely PI Scoring Level (<60, 60-79, ≥ 80)	60-79

Evaluation Table for PI 2.5.3 – Ecosystem information

PI 2.5.3	There is adequate knowledge of the impacts of the UoA on the ecosystem.			
Scoring Issue	SG 60	SG 80	SG 100	
a	Information quality			
Guidpost	Information is adequate to identify the key elements of the ecosystem.	Information is adequate to broadly understand the key elements of the ecosystem.		
Met?	Yes, information is adequate	(Y/N)		
b	Investigation of UoA impacts			
Guidpost	Main impacts of the UoA on these key ecosystem elements can be inferred from existing information, but have not been investigated in detail.	Main impacts of the UoA on these key ecosystem elements can be inferred from existing information, and some have been investigated in detail .	Main interactions between the UoA and these ecosystem elements can be inferred from existing information, and have been investigated in detail .	
Met?	Yes	(Y/N)	(Y/N)	
c	Understanding of component functions			
Guidpost		The main functions of the components (i.e., PI target species, primary, secondary and ETP species and Habitats) in the ecosystem are known .	The impacts of the UoA on PI target species, primary, secondary and ETP species and Habitats are identified and the main functions of these components in the ecosystem are understood .	
Met?		Yes, readily available e.g. on Fishbase	(Y/N)	
d	Information relevance			
Guidpost		Adequate information is available on the impacts of the UoA on these components to allow some of the main	Adequate information is available on the impacts of the UoA on the components and elements to allow the main	

PI 2.5.3	There is adequate knowledge of the impacts of the UoA on the ecosystem.		
			consequences for the ecosystem to be inferred.
	Met?		Information is not adequate on impacts of the UoA
e	Monitoring		
	Guidepost		Adequate data continue to be collected to detect any increase in risk level.
	Met?		No
Overall PI justification	Information is adequate to identify the key elements of the ecosystem The main functions of the components in the ecosystem are known e.g. on Fishbase Information is not adequate on impacts of the UoA No adequate data continue to be collected to detect any increase in risk level		
References			

Likely PI Scoring Level (<60, 60-79, ≥ 80)	<60
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Principle 3 Effective and responsible management

Evaluation Table for PI 3.1.1 – Legal and/or customary framework

PI 3.1.1	<p>The management system exists within an appropriate legal and/or customary framework which ensures that it:</p> <ul style="list-style-type: none"> • Is capable of delivering sustainability in the UoA(s); and • Observes the legal rights created explicitly or established by custom of people dependent on fishing for food or livelihood; and • Incorporates an appropriate dispute resolution framework. 			
Scoring Issue	SG 60	SG 80	SG 100	
a	Compatibility of laws or standards with effective management			
	Guidepost	There is an effective national legal system and a framework for cooperation with other parties, where necessary, to deliver management outcomes consistent with MSC Principles 1 and 2	There is an effective national legal system and organised and effective cooperation with other parties, where necessary, to deliver management outcomes consistent with MSC Principles 1 and 2.	There is an effective national legal system and binding procedures governing cooperation with other parties which delivers management outcomes consistent with MSC Principles 1 and 2.
	Met?	(Y/N)	(Y/N)	Yes
b	Resolution of disputes			
	Guidepost	The management system incorporates or is subject by law to a mechanism for the resolution of legal disputes arising within the system.	The management system incorporates or is subject by law to a transparent mechanism for the resolution of legal disputes which is considered to be effective in dealing with	The management system incorporates or is subject by law to a transparent mechanism for the resolution of legal disputes that is appropriate to the context of the fishery and

PI 3.1.1	<p>The management system exists within an appropriate legal and/or customary framework which ensures that it:</p> <ul style="list-style-type: none"> Is capable of delivering sustainability in the UoA(s); and Observes the legal rights created explicitly or established by custom of people dependent on fishing for food or livelihood; and Incorporates an appropriate dispute resolution framework. 			
			most issues and that is appropriate to the context of the UoA.	has been tested and proven to be effective.
	Met?	(Y/N)	Yes	(Y/N)
c	Respect for rights			
	Guidepost	The management system has a mechanism to generally respect the legal rights created explicitly or established by custom of people dependent on fishing for food or livelihood in a manner consistent with the objectives of MSC Principles 1 and 2.	The management system has a mechanism to observe the legal rights created explicitly or established by custom of people dependent on fishing for food or livelihood in a manner consistent with the objectives of MSC Principles 1 and 2.	The management system has a mechanism to formally commit to the legal rights created explicitly or established by custom of people dependent on fishing for food and livelihood in a manner consistent with the objectives of MSC Principles 1 and 2.
	Met?	(Y/N)	(Y/N)	Yes
Overall PI justification	<p>The management system exists within an appropriate legal and/or customary framework which ensures that it:</p> <ul style="list-style-type: none"> Is capable of delivering sustainability in the UoA(s); and Observes the legal rights created explicitly or established by custom of people dependent on fishing for food or livelihood; and <p>Incorporates an appropriate dispute resolution framework</p>			
References	Fisheries management and development act, 2016			
			Likely PI Scoring Level (<60, 60-79, ≥ 80)	≥ 80

Evaluation Table for PI 3.1.2 – Consultation, roles and responsibilities

PI 3.1.2	<p>The management system has effective consultation processes that are open to interested and affected parties.</p> <p>The roles and responsibilities of Organizations and individuals who are involved in the management process are clear and understood by all relevant parties</p>			
Scoring Issue	SG 60	SG 80	SG 100	
a	Roles and responsibilities			
	Guidepost	Organizations and individuals involved in the management process have been identified. Functions, roles and responsibilities are generally understood.	Organizations and individuals involved in the management process have been identified. Functions, roles and responsibilities are explicitly defined and well understood for key	Organizations and individuals involved in the management process have been identified. Functions, roles and responsibilities are explicitly defined and well understood for all

PI 3.1.2		The management system has effective consultation processes that are open to interested and affected parties. The roles and responsibilities of Organizations and individuals who are involved in the management process are clear and understood by all relevant parties		
			areas of responsibility and interaction.	areas of responsibility and interaction.
	Met?	(Y/N)	(Y/N)	Yes
b	Consultation processes			
	Guidepost	The management system includes consultation processes that obtain relevant information from the main affected parties, including local knowledge, to inform the management system.	The management system includes consultation processes that regularly seek and accept relevant information, including local knowledge. The management system demonstrates consideration of the information obtained.	The management system includes consultation processes that regularly seek and accept relevant information, including local knowledge. The management system demonstrates consideration of the information and explains how it is used or not used.
	Met?	(Y/N)	Yes	(Y/N)
c	Participation			
	Guidepost		The consultation process provides opportunity for all interested and affected parties to be involved.	The consultation process provides opportunity and encouragement for all interested and affected parties to be involved, and facilitates their effective engagement.
	Met?		(Y/N)	Yes
Overall PI justification		Organizations and individuals involved in the management process have been identified The management system includes consultation processes that regularly seek and accept relevant information, including local knowledge The consultation process provides opportunity and encouragement for all		
References		Stakeholder consultation minutes		
			Likely PI Scoring Level (<60, 60-79, ≥ 80)	≥ 80

Evaluation Table for PI 3.1.3 – Long term objectives

PI 3.1.3		The management policy has clear long-term objectives to guide decision-making that are consistent with MSC fisheries standard, and incorporates the precautionary approach.		
Scoring Issue	SG 60	SG 80	SG 100	
a	Objectives			
	Guidepost	Long-term objectives to guide decision-making, consistent with the MSC fisheries standard and the	Clear long-term objectives that guide decision-making, consistent with MSC fisheries standard and the precautionary	Clear long-term objectives that guide decision-making, consistent with MSC fisheries standard and the precautionary

PI 3.1.3	The management policy has clear long-term objectives to guide decision-making that are consistent with MSC fisheries standard, and incorporates the precautionary approach.		
	precautionary approach, are implicit within management policy.	approach are explicit within management policy.	approach, are explicit within and required by management policy.
Met?	(Y/N/Partial)	(Y/N/Partial)	Yes
Overall PI justification	The management policy has clear long-term objectives to guide decision-making that are consistent with MSC fisheries standard Management incorporates precautionary principle		
References	General Fisheries regulations; Fisheries management and development act, 2016; ICZM;		
	Likely PI Scoring Level (<60, 60-79, ≥ 80)		≥ 80

Evaluation Table for PI 3.2.1 Fishery-specific objectives

PI 3.2.1	The fishery-specific management system has clear, specific objectives designed to achieve the outcomes expressed by MSC’s Principles 1 and 2.		
Scoring Issue	SG 60	SG 80	SG 100
a	Objectives		
Guidepost	Objectives , which are broadly consistent with achieving the outcomes expressed by MSC’s Principles 1 and 2, are implicit within the fishery-specific management system.	Short and long-term objectives , which are consistent with achieving the outcomes expressed by MSC’s Principles 1 and 2, are explicit within the fishery-specific management system.	Well defined and measurable short and long-term objectives , which are demonstrably consistent with achieving the outcomes expressed by MSC’s Principles 1 and 2, are explicit within the fishery-specific management system.
Met?	Yes	(Y/N/Partial)	(Y/N/Partial)
Overall PI justification	The fishery-specific management system has clear, specific objectives		
References	Tuna development and management strategy 2013-2018		
	Likely PI Scoring Level (<60, 60-79, ≥ 80)		60-79

Evaluation Table for PI 3.2.2 – Decision-making processes

PI 3.2.2	The fishery-specific management system includes effective decision-making processes that result in measures and strategies to achieve the objectives, and has an appropriate approach to actual disputes in the fishery.		
Scoring Issue	SG 60	SG 80	SG 100
a	Decision-making processes		
Guidepost	There are some decision-making processes in place that result in measures and strategies to achieve	There are established decision-making processes that result in measures and strategies to achieve the fishery-specific objectives.	

PI 3.2.2	The fishery-specific management system includes effective decision-making processes that result in measures and strategies to achieve the objectives, and has an appropriate approach to actual disputes in the fishery.		
	the fishery-specific objectives.		
	Met?	Yes	(Y/N)
b	Responsiveness of decision-making processes		
	Guidepost	Decision-making processes respond to serious issues identified in relevant research, monitoring, evaluation and consultation, in a transparent, timely and adaptive manner and take some account of the wider implications of decisions.	Decision-making processes respond to serious and other important issues identified in relevant research, monitoring, evaluation and consultation, in a transparent, timely and adaptive manner and take account of the wider implications of decisions.
	Met?	Yes	(Y/N)
c	Use of precautionary approach		
	Guidepost		Decision-making processes use the precautionary approach and are based on best available information.
	Met?		Yes
d	Accountability and transparency of management system and decision-making process		
	Guidepost	Some information on the fishery's performance and management action is generally available on request to stakeholders.	Information on the fishery's performance and management action is available on request , and explanations are provided for any actions or lack of action associated with findings and relevant recommendations emerging from research, monitoring, evaluation and review activity.
	Met?	(Y/N)	Yes
e	Approach to disputes		
	Guidepost	Although the management authority or fishery may be subject to continuing court challenges, it is not indicating a disrespect or defiance of the law by	The management system or fishery is attempting to comply in a timely fashion with judicial decisions arising from any legal challenges.
			The management system or fishery acts proactively to avoid legal disputes or rapidly implements judicial decisions arising from legal challenges.

PI 3.2.2	The fishery-specific management system includes effective decision-making processes that result in measures and strategies to achieve the objectives, and has an appropriate approach to actual disputes in the fishery.		
	repeatedly violating the same law or regulation necessary for the sustainability for the fishery.		
Met?	(Y/N)	(Y/N)	Yes
Overall PI justification	<p>There are some decision-making processes in place</p> <p>Decision-making processes respond to serious issues identified in relevant research, monitoring, evaluation and consultation</p> <p>Decision-making processes use the precautionary approach</p> <p>Information on the fishery's performance and management action is available on request</p> <p>The management system or fishery acts proactively</p>		
References	IOTC reports and general fisheries regulations; Tuna management and development strategy 2013-2018		
		Likely PI Scoring Level (<60, 60-79, ≥ 80)	60-79

Evaluation Table for PI 3.2.3 – Compliance and enforcement

PI 3.2.3	Monitoring, control and surveillance mechanisms ensure the management measures in the fishery are enforced and complied with.		
Scoring Issue	SG 60	SG 80	SG 100
a	MCS implementation		
Guidepost	Monitoring, control and surveillance mechanisms exist, and are implemented in the fishery and there is a reasonable expectation that they are effective.	A monitoring, control and surveillance system has been implemented in the fishery and has demonstrated an ability to enforce relevant management measures, strategies and/or rules.	A comprehensive monitoring, control and surveillance system has been implemented in the fishery and has demonstrated a consistent ability to enforce relevant management measures, strategies and/or rules.
Met?	Yes	(Y/N)	(Y/N)
b	Sanctions		
Guidepost	Sanctions to deal with non-compliance exist and there is some evidence that they are applied.	Sanctions to deal with non-compliance exist, are consistently applied and thought to provide effective deterrence.	Sanctions to deal with non-compliance exist, are consistently applied and demonstrably provide effective deterrence.
Met?	(Y/N)	Yes	(Y/N)
c	Compliance		
Guidepost	Fishers are generally thought to comply with the management system for the fishery	Some evidence exists to demonstrate fishers comply with the management system	There is a high degree of confidence that fishers comply with the management system

PI 3.2.3	Monitoring, control and surveillance mechanisms ensure the management measures in the fishery are enforced and complied with.		
	under assessment, including, when required, providing information of importance to the effective management of the fishery.	under assessment, including, when required, providing information of importance to the effective management of the fishery.	under assessment, including, providing information of importance to the effective management of the fishery.
Met?	Yes	(Y/N)	(Y/N)
d	Systematic non-compliance		
Guidepost		There is no evidence of systematic non-compliance.	
Met?		Yes	
Overall PI justification	Monitoring, control and surveillance mechanisms exist, and are effectively implemented in the fishery Sanctions to deal with non-compliance exist, are consistently applied Fishers are generally thought to comply with the management system for the fishery		
References	General Fisheries regulations; IOTC reports, Tuna development and Management strategy		
	Likely PI Scoring Level (<60, 60-79, ≥ 80)	60-79	

Evaluation Table for PI 3.2.4 – Monitoring and management performance evaluation

PI 3.2.4	There is a system of monitoring and evaluating the performance of the fishery-specific management system against its objectives. There is effective and timely review of the fishery-specific management system.		
Scoring Issue	SG 60	SG 80	SG 100
a	Evaluation coverage		
Guidepost	There are mechanisms in place to evaluate some parts of the fishery-specific management system.	There are mechanisms in place to evaluate key parts of the fishery-specific management system	There are mechanisms in place to evaluate all parts of the fishery-specific management system.
Met?	Yes	(Y/N)	(Y/N)
b	Internal and/or external review		
Guidepost	The fishery-specific management system is subject to occasional internal review.	The fishery-specific management system is subject to regular internal and occasional external review.	The fishery-specific management system is subject to regular internal and external review.
Met?	Yes	(Y/N)	(Y/N)
Overall PI justification	There are mechanisms in place to evaluate some parts of the fishery-specific management system The fishery-specific management system is subject to occasional internal review		
References	IOTC reports and the Kenya Tuna development and Management strategy 2013-2018		

PI 3.2.4	There is a system of monitoring and evaluating the performance of the fishery-specific management system against its objectives.	Likely PI Scoring Level (<60, 60-79, ≥ 80)	60-79
	There is effective and timely review of the fishery-specific management system.		

Appendix 4: MSC's BMT Baseline Status & 5-year projections for the *T. albacares* Fishery

Principle	Component	Performance Indicator	Actual 2019	Expected 2020	Expected 2021	Expected 2022	Expected 2023
1	Outcome	1.1.1 Stock status	<60	<60	60-79	60-79	≥80
		1.1.2 Stock rebuilding	<60	<60	<60	<60	60-79
	Management	1.2.1 Harvest Strategy	<60	<60	<60	60-79	60-79
		1.2.2 Harvest control rules and tools	<60	<60	<60	60-79	60-79
		1.2.3 Information and monitoring	<60	60-79	60-79	≥80	≥80
	1.2.4 Assessment of stock status	60-79	60-79	≥80	≥80	≥80	
2	Primary species	2.1.1 Outcome	<60	<60	60-79	60-79	≥80
		2.1.2 Management	<60	60-79	60-79	≥80	≥80
		2.1.3 Information	<60	60-79	60-79	≥80	≥80
	Secondary species	2.2.1 Outcome	<60	<60	<60	60-79	60-79
		2.2.2 Management	60-79	60-79	60-79	≥80	≥80
		2.2.3 Information	<60	<60	60-79	60-79	≥80
	ETP species	2.3.1 Outcome	<60	<60	<60	60-79	60-79
		2.3.2 Management	<60	<60	60-79	60-79	60-79
		2.3.3 Information	<60	60-79	60-79	≥80	≥80
	Habitats	2.4.1 Outcome	60-79	60-79	≥80	≥80	≥80
		2.4.2 Management	---	---	---	---	---
		2.4.3 Information	60-79	60-79	≥80	≥80	≥80
	Ecosystem	2.5.1 Outcome	≥80	≥80	≥80	≥80	≥80
		2.5.2 Management	60-79	60-79	60-79	≥80	≥80
2.5.3 Information		<60	<60	60-79	60-79	≥80	
3	Governance & Policy	3.1.1 Legal and customary framework	≥80	≥80	≥80	≥80	≥80
		3.1.2 Consultation, roles and responsibilities	≥80	≥80	≥80	≥80	≥80
		3.1.3 Long term objectives	≥80	≥80	≥80	≥80	≥80
	Fishery specific management system	3.2.1 Fishery specific objectives	60-79	60-79	≥80	≥80	≥80
		3.2.2 Decision making processes	60-79	60-79	60-79	≥80	≥80
		3.2.3 Compliance and enforcement	60-79	60-79	60-79	60-79	≥80
		3.2.4 Management performance evaluation	60-79	60-79	60-79	≥80	≥80
Total number of PIs equal to or greater than 80			4	4	8	16	21
Total number of PIs 60-79			9	13	14	10	6
Total number of PIs less than 60			14	10	5	1	0
Overall BMT Index			0.31	0.39	0.56	0.78	0.89

Appendix 5: MSC Pre-assessment Results for the *T. affinis* & *T. obesus* Tuna Fishery

Principle 1: Sustainability of Exploited *Euthynnus affinis* & *Thunnus obesus* Fish Stocks

Evaluation Table for PI 1.1.1 – Stock status

PI 1.1.1		The stock is at a level which maintains high productivity and has a low probability of recruitment overfishing		
Scoring Issue		SG 60	SG 80	SG 100
a	Stock status relative to recruitment impairment			
	Guidepost	It is likely that the stock is above the point where recruitment would be impaired (PRI).	It is highly likely that the stock is above the PRI.	There is a high degree of certainty that the stock is above the PRI.
	Met?		(Y/N)	Yes, based on IOTC (2018) report: The two species are not overfished and not subject to overfishing
b	Stock status in relation to achievement of MSY			
	Guide post		The stock is at or fluctuating around a level consistent with MSY.	There is a high degree of certainty that the stock has been fluctuating around a level consistent with MSY or has been above this level over recent years.
	Met?			Yes
Overall PI justification		SKJ: Yield _{40%} SSB (1000 t) (80% CI): 510.1 (455.9–618.8) SB ₂₀₁₆ /SB ₀ (80% CI): 0.59 (0.53-0.65) KAW: F _{curr} /F _{msy} = 0.85 – 1.11; Mean = 0.98 B _{MSY} = 151,000 – 315,000; Mean = 202,000 MSY = 152,000t (125,000 – 188,000)		
References		IOTC (2018) report: The skipjack tuna stock is at the target biomass reference point and the current mortality rates are estimated to be below the target. Thus, on the weight-of-evidence available in 2018, the skipjack tuna stock is determined to be not overfished and is not subject to overfishing.		
RBF Required? (✓/✗/)		X	Likely PI Scoring Level (<60, 60-79, ≥ 80)	≥ 80
Stock Status relative to Reference Points				
	Type of reference point	Value of reference point		Current stock status relative to reference point
Reference point used in scoring stock relative to PRI (SIa)	SKJ: SB _{CURR} KAW: B _{CURR} , B _{MSY} IOTC reports	IOTC reports		IOTC reports
Reference point used in scoring stock relative to MSY (SIb)	IOTC reports	IOTC reports		IOTC reports

Evaluation Table for PI 1.1.1A - key LTL [NOTE: only use this table for stocks identified as key LTL]

PI 1.1.1 A	The stock is at a level which has a low probability of serious ecosystem impacts		
Scoring Issue	SG 60	SG 80	SG 100
a	Stock status relative to ecosystem impairment		
Guidepost	It is likely that the stock is above the point where serious ecosystem impacts could occur.	It is highly likely that the stock is above the point where serious ecosystem impacts could occur.	There is a high degree of certainty that the stock is above the point where serious ecosystem impacts could occur.
Met?	(Y/N)	(Y/N)	(Y/N)
b	Stock status in relation to ecosystem needs		
Guidepost		The stock is at or fluctuating around a level consistent with ecosystem needs.	There is a high degree of certainty that the stock has been fluctuating around a level consistent with ecosystem needs or has been above this level over recent years.
Met?		(Y/N)	(Y/N)
Overall PI justification	No LTL		
References	N/A		
RBF Required? (✓/✗/)	N/A	Likely PI Scoring Level (<60, 60-79, ≥ 80)	NO SCORE
Stock Status relative to Reference Points			
	Type of reference point	Value of reference point	Current stock status relative to reference point
Reference point used in scoring stock relative to ecosystem impairment (SIa)	[e.g. B _{35%}]	[Include value specifying units. e.g. 50,000t total stock biomass]	[Include current stock status in the same units as the reference point e.g. 90,000/B _{35%} =1.8]
Reference point used in scoring Stock Relative To Ecosystem Needs (SIB)	[e.g. B _{75%}]	[Include value specifying units. e.g. 100,000t total stock biomass]	[Include current stock status in the same units as the reference point e.g. 90,000/B _{75%} =0.9]

Evaluation Table for PI 1.1.2 – Stock rebuilding

PI 1.1.2	Where the stock is reduced, there is evidence of stock rebuilding within a specified timeframe		
Scoring Issue	SG 60	SG 80	SG 100
a	Rebuilding timeframes		
Guidepost	A rebuilding timeframe is specified for the stock that is the shorter of 20 years or 2 times its generation time . For cases where 2 generations is less than 5 years, the rebuilding timeframe is up to 5 years.		The shortest practicable rebuilding timeframe is specified which does not exceed one generation time for the stock.
Met?	N/A	N/A	N/A
b	Rebuilding evaluation		
Guidepost	Monitoring is in place to determine whether the rebuilding strategies are effective in rebuilding the stock within the specified timeframe.	There is evidence that the rebuilding strategies are rebuilding stocks, or it is likely based on simulation modeling, exploitation rates or previous performance that they will be able to rebuild the stock within the specified timeframe.	There is strong evidence that the rebuilding strategies are rebuilding stocks, or it is highly likely based on simulation modeling, exploitation rates or previous performance that they will be able to rebuild the stock within the specified timeframe.
Met?	N/A	N/A	N/A
Overall PI justification	No rebuilding needed		
References	IOTC reports		
		Likely PI Scoring Level (<60, 60-79, ≥ 80)	NOT SCORE

Evaluation Table for PI 1.2.1 – Harvest strategy

PI 1.2.1	There is a robust and precautionary harvest strategy in place		
Scoring Issue	SG 60	SG 80	SG 100
a	Harvest strategy design		
Guidepost	The harvest strategy is expected to achieve stock management objectives reflected in PI 1.1.1 SG80.	The harvest strategy is responsive to the state of the stock and the elements of the harvest strategy work together towards achieving stock management objectives reflected in PI 1.1.1 SG80.	The harvest strategy is responsive to the state of the stock and is designed to achieve stock management objectives reflected in PI 1.1.1 SG80.

PI 1.2.1		There is a robust and precautionary harvest strategy in place		
	Met?	Yes, however this is based on IOTC harvest strategy, need for a national harvest strategy	(Y/N)	(Y/N)
b	Harvest strategy evaluation			
	Guidepost	The harvest strategy is likely to work based on prior experience or plausible argument.	The harvest strategy may not have been fully tested but evidence exists that it is achieving its objectives.	The performance of the harvest strategy has been fully evaluated and evidence exists to show that it is achieving its objectives including being clearly able to maintain stocks at target levels.
	Met?	Yes, however this is based on IOTC harvest strategy, need for a national harvest strategy	(Y/N)	(Y/N)
c	Harvest strategy monitoring			
	Guidepost	Monitoring is in place that is expected to determine whether the harvest strategy is working.		
	Met?	There is monitoring but not adequate		
d	Harvest strategy review			
	Guidepost			The harvest strategy is periodically reviewed and improved as necessary.
	Met?			(N)
e	Shark finning			
	Guidepost	It is likely that shark finning is not taking place.	It is highly likely that shark finning is not taking place.	There is a high degree of certainty that shark finning is not taking place.
	Met?	(Y)	(Y/N/Not relevant)	(Y/N/Not relevant)
f	Review of alternative measures			
	Guidepost	There has been a review of the potential effectiveness and practicality of alternative measures to minimize UoA-related mortality of unwanted	There is a regular review of the potential effectiveness and practicality of alternative measures to minimize UoA-related mortality of unwanted catch of the target stock	There is a biennial review of the potential effectiveness and practicality of alternative measures to minimize UoA-related mortality of unwanted catch of the target stock, and they

PI 1.2.1	There is a robust and precautionary harvest strategy in place		
	catch of the target stock.	and they are implemented as appropriate.	are implemented, as appropriate.
	Met?	None	(Y/N/Not relevant)
Overall PI justification	IOTC report 2017 IOTC harvest strategy available, need for a national harvest strategy There is monitoring of the harvest strategy but not adequate No reviews for the harvest strategy		
References	IOTC report 2017		
	Likely PI Scoring Level (<60, 60-79, ≥ 80)	<60	

Evaluation Table for PI 1.2.2 – Harvest control rules and tools

PI 1.2.2	There are well defined and effective harvest control rules (HCRs) in place		
Scoring Issue	SG 60	SG 80	SG 100
a	HCRs design and application		
	Guidepost	Generally understood HCRs are in place or available that are expected to reduce the exploitation rate as the point of recruitment impairment (PRI) is approached.	Well defined HCRs are in place that ensure that the exploitation rate is reduced as the PRI is approached, are expected to keep the stock fluctuating around a target level consistent with (or above) MSY, or for key LTL species a level consistent with ecosystem needs.
	Met?	(Y/N)	(Y/N)
b	HCRs robustness to uncertainty		
	Guidepost	The HCRs are likely to be robust to the main uncertainties.	The HCRs take account of a wide range of uncertainties including the ecological role of the stock, and there is evidence that the HCRs are robust to the main uncertainties.
	Met?	(Y/N)	(Y/N)
c	HCRs evaluation		
	Guidepost	There is some evidence that tools used or available to implement HCRs are appropriate and effective in controlling exploitation.	Available evidence indicates that the tools in use are appropriate and effective in achieving the exploitation levels required under the HCRs.
	Met?	(Y/N)	(Y/N)

PI 1.2.2	There are well defined and effective harvest control rules (HCRs) in place		
Met?	(Y/N)	(Y/N)	(Y/N)
Overall PI justification	No harvest strategy in place		
References	Not available		
		Likely PI Scoring Level (<60, 60-79, ≥ 80)	<60

Evaluation Table for PI 1.2.3 – Information and monitoring

PI 1.2.3	Relevant information is collected to support the harvest strategy		
Scoring Issue	SG 60	SG 80	SG 100
a	Range of information		
Guidepost	Some relevant information related to stock structure, stock productivity and fleet composition is available to support the harvest strategy.	Sufficient relevant information related to stock structure, stock productivity, fleet composition and other data is available to support the harvest strategy.	A comprehensive range of information (on stock structure, stock productivity, fleet composition, stock abundance, UoA removals and other information such as environmental information), including some that may not be directly related to the current harvest strategy, is available.
Met?	Yes, there is some information on fleet composition, IOTC reports	(Y/N)	(Y/N)
b	Monitoring		
Guidepost	Stock abundance and UoA removals are monitored and at least one indicator is available and monitored with sufficient frequency to support the harvest control rule.	Stock abundance and UoA removals are regularly monitored at a level of accuracy and coverage consistent with the harvest control rule , and one or more indicators are available and monitored with sufficient frequency to support the harvest control rule.	All information required by the harvest control rule is monitored with high frequency and a high degree of certainty, and there is a good understanding of inherent uncertainties in the information [data] and the robustness of assessment and management to this uncertainty.
Met?	No	(Y/N)	(Y/N)
c	Comprehensiveness of information		
Guidepost		There is good information on all other fishery removals from the stock.	
Met?		No	

PI 1.2.3	Relevant information is collected to support the harvest strategy		
Overall PI justification	Limited monitoring and research done on UOA There is some information on fleet composition, IOTC reports		
References	IOTC reports 2017		
	Likely PI Scoring Level (<60, 60-79, ≥ 80)	<60	

Evaluation Table for PI 1.2.4 – Assessment of stock status

PI 1.2.4	There is an adequate assessment of the stock status		
Scoring Issue	SG 60	SG 80	SG 100
a	Appropriateness of assessment to stock under consideration		
	Guidepost	The assessment is appropriate for the stock and for the harvest control rule.	The assessment takes into account the major features relevant to the biology of the species and the nature of the UoA.
	Met?	Yes, IOTC	(Y/N)
b	Assessment approach		
	Guidepost	The assessment estimates stock status relative to generic reference points appropriate to the species category.	The assessment estimates stock status relative to reference points that are appropriate to the stock and can be estimated.
	Met?	(Y/N)	Yes, IOTC
c	Uncertainty in the assessment		
	Guidepost	The assessment identifies major sources of uncertainty.	The assessment takes uncertainty into account. The assessment takes into account uncertainty and is evaluating stock status relative to reference points in a probabilistic way.
	Met?	Yes, IOTC report	(Y/N) (Y/N)
d	Evaluation of assessment		
	Guidepost		The assessment has been tested and shown to be robust. Alternative hypotheses and assessment approaches have been rigorously explored.
	Met?		Yes
e	Peer review of assessment		
	Guidepost	The assessment of stock status is subject to peer review.	The assessment has been internally and externally peer reviewed.
	Met?	(Y/N)	Yes
Overall PI justification	The assessment is appropriate for the stock and for the harvest control rule The assessment estimates stock status relative to reference points that are appropriate to the stock and can be estimated.		

PI 1.2.4	There is an adequate assessment of the stock status		
	The assessment estimates stock status relative to reference points that are appropriate to the stock and can be estimated.		
References	IOTC reports; CAS data from SDF&BE and KEMFRI		
	Likely PI Scoring Level (<60, 60-79, ≥ 80)	60-79	

Principle 2: Maintenance of the Fishery Ecosystem

Katsuwonis pelamis, Scomberomorus commerson, Xiphias gladius, Acanthocybium solandri & Coryphaena hippurus

Evaluation Table for PI 2.1.1 – Primary species outcome

PI 2.1.1	The UoA aims to maintain primary species above the PRI and does not hinder recovery of primary species if they are below the PRI.		
Scoring Issue	SG 60	SG 80	SG 100
a	Main primary species stock status		
Guidepost	Main primary species are likely to be above the PRI OR If the species is below the PRI, the UoA has measures in place that are expected to ensure that the UoA does not hinder recovery and rebuilding.	Main primary species are highly likely to be above the PRI OR If the species is below the PRI, there is either evidence of recovery or a demonstrably effective strategy in place between all MSC UoAs which categorize this species as main , to ensure that they collectively do not hinder recovery and rebuilding.	There is a high degree of certainty that main primary species are above the PRI and are fluctuating around a level consistent with MSY.
Met? NB: varies by species	Others: Info/data is inadequate to estimate stock status. Shark species are likely below (Kiilu, Odennyo thesis)		<i>K. pelamis</i> : refer to IOTC report (2018)
b	Minor primary species stock status		
Guidepost			Minor primary species are highly likely to be above the PRI OR If below the PRI, there is evidence that the UoA does not hinder the recovery and rebuilding of minor primary species
Met?			Not relevant
Overall PI justification	Info/data is inadequate to estimate stock status. Shark species are likely below and the information vary by species		

PI 2.1.1	The UoA aims to maintain primary species above the PRI and does not hinder recovery of primary species if they are below the PRI.		
References	Kiilu, Odennyo thesis; IOTC reports		
RBF Required? (✓/✗/)	✓ RBF Required	Likely PI Scoring Level (<60, 60-79, ≥ 80)	<60

Evaluation Table for PI 2.1.2 – Primary species management strategy

PI 2.1.2	There is a strategy in place that is designed to maintain or to not hinder rebuilding of primary species, and the UoA regularly reviews and implements measures, as appropriate, to minimize the mortality of unwanted catch.		
Scoring Issue	SG 60	SG 80	SG 100
a	Management strategy in place		
Guidepost	There are measures in place for the UoA, if necessary, that are expected to maintain or to not hinder rebuilding of the main primary species at/to levels which are likely to above the point where recruitment would be impaired.	There is a partial strategy in place for the UoA, if necessary, that is expected to maintain or to not hinder rebuilding of the main primary species at/to levels which are highly likely to be above the point where recruitment would be impaired.	There is a strategy in place for the UoA for managing main and minor primary species.
Met?	No measures in place	(Y/N)	(Y/N)
b	Management strategy evaluation		
Guidepost	The measures are considered likely to work, based on plausible argument (e.g., general experience, theory or comparison with similar fisheries/species).	There is some objective basis for confidence that the measures/partial strategy will work, based on some information directly about the fishery and/or species involved.	Testing supports high confidence that the partial strategy/strategy will work, based on information directly about the fishery and/or species involved.
Met?	No measures in place	(Y/N)	(Y/N)
c	Management strategy implementation		
Guidepost		There is some evidence that the measures/partial strategy is being implemented successfully .	There is clear evidence that the partial strategy/strategy is being implemented successfully and is achieving its overall objective as set out in scoring issue (a).
Met?		No measures in place	(Y/N)
d	Shark finning		
Guidepost	It is likely that shark finning is not taking place.	It is highly likely that shark finning is not taking place.	There is a high degree of certainty that shark finning is not taking place.

PI 2.1.2		There is a strategy in place that is designed to maintain or to not hinder rebuilding of primary species, and the UoA regularly reviews and implements measures, as appropriate, to minimize the mortality of unwanted catch.		
	Met?	Yes, sharks are eaten so not likely to be finned and discarded in this fishery	(Y/N/Not relevant)	(Y/N/Not relevant)
e	Review of alternative measures			
	Guidepost	There is a review of the potential effectiveness and practicality of alternative measures to minimize UoA-related mortality of unwanted catch of main primary species.	There is a regular review of the potential effectiveness and practicality of alternative measures to minimize UoA-related mortality of unwanted catch of main primary species and they are implemented as appropriate.	There is a biennial review of the potential effectiveness and practicality of alternative measures to minimize UoA-related mortality of unwanted catch of all primary species, and they are implemented, as appropriate.
	Met?	No strategy in place	(Y/N/Not relevant)	(Y/N/Not relevant)
Overall PI justification		No management strategy in place Shark finning likelihood available		
References		IOTC reports		
			Likely PI Scoring Level (<60, 60-79, ≥ 80)	<60

Evaluation Table for PI 2.1.3 – Primary species information

PI 2.1.3		Information on the nature and extent of primary species is adequate to determine the risk posed by the UoA and the effectiveness of the strategy to manage primary species		
Scoring Issue		SG 60	SG 80	SG 100
a	Information adequacy for assessment of impact on main primary species			
	Guidepost	Qualitative information is adequate to estimate the impact of the UoA on the main primary species with respect to status. OR If RBF is used to score PI 2.1.1 for the UoA: Qualitative information is adequate to estimate productivity and susceptibility attributes for main primary species.	Some quantitative information is available and is adequate to assess the impact of the UoA on the main primary species with respect to status. OR If RBF is used to score PI 2.1.1 for the UoA: Some quantitative information is adequate to assess productivity and susceptibility attributes for main primary species.	Quantitative information is available and is adequate to assess with a high degree of certainty the impact of the UoA on main primary species with respect to status.

PI 2.1.3		Information on the nature and extent of primary species is adequate to determine the risk posed by the UoA and the effectiveness of the strategy to manage primary species		
	Met?	Yes, some information is available on species and size composition	(Y/N)	(Y/N)
b	Information adequacy for assessment of impact on minor primary species			
	Guidepost			Some quantitative information is adequate to estimate the impact of the UoA on minor primary species with respect to status.
	Met?			Not relevant (no minor primary species)
c	Information adequacy for management strategy			
	Guidepost	Information is adequate to support measures to manage main primary species.	Information is adequate to support a partial strategy to manage main Primary species.	Information is adequate to support a strategy to manage all primary species, and evaluate with a high degree of certainty whether the strategy is achieving its objective.
	Met?	Not adequate	(Y/N)	(Y/N)
Overall PI justification		some information is available on species and size composition Information available is not adequate		
References		IOTC reports; fleet data		
			Likely PI Scoring Level (<60, 60-79, ≥ 80)	<60

Evaluation Table for PI 2.2.1 – Secondary species outcome

PI 2.2.1		The UoA aims to maintain secondary species above a biologically based limit and does not hinder recovery of secondary species if they are below a biological based limit.		
Scoring Issue		SG 60	SG 80	SG 100
a	Main secondary species stock status			
	Guidepost	Main Secondary species are likely to be within biologically based limits. OR If below biologically based limits, there are measures in place expected to ensure that the UoA does not hinder recovery and rebuilding.	Main secondary species are highly likely to be above biologically based limits OR If below biologically based limits, there is either evidence of recovery or a demonstrably effective partial strategy in place such that the UoA does not hinder recovery and rebuilding.	There is a high degree of certainty that main secondary species are within biologically based limits.

PI 2.2.1	The UoA aims to maintain secondary species above a biologically based limit and does not hinder recovery of secondary species if they are below a biological based limit.		
			AND Where catches of a main secondary species outside of biological limits are considerable, there is either evidence of recovery or a, demonstrably effective strategy in place between those MSC UoAs that also have considerable catches of the species, to ensure that they collectively do not hinder recovery and rebuilding.
Met?	Information is inadequate, although it is likely that most sharks and rays are below PRI based on their biological characteristics and fishing effort	(Y/N)	(Y/N)
b	Minor secondary species stock status		
Guided post			Minor secondary species are highly likely to be above biologically based limits. OR If below biologically based limits', there is evidence that the UoA does not hinder the recovery and rebuilding of secondary species
Met?			Not relevant
Overall PI justification	Information is inadequate, although it is likely that most sharks and rays are below PRI based on their biological characteristics and fishing effort No minor secondary species identified in the fishery		
References	IOTC reports 2017		
RBF Required? (✓/✗/)	✗	Likely PI Scoring Level (<60, 60-79, ≥ 80)	<60

Evaluation Table for PI 2.2.2 – Secondary species management strategy

PI 2.2.2	There is a strategy in place for managing secondary species that is designed to maintain or to not hinder rebuilding of secondary species and the UoA regularly reviews and implements measures, as appropriate, to minimize the mortality of unwanted catch.		
Scoring Issue	SG 60	SG 80	SG 100
a	Management strategy in place		
Guidepost	There are measures in place, if necessary, which are expected to maintain or not hinder rebuilding of main secondary species at/to levels which are highly likely to be within biologically based limits or to ensure that the UoA does not hinder their recovery.	There is a partial strategy in place, if necessary, for the UoA that is expected to maintain or not hinder rebuilding of main secondary species at/to levels which are highly likely to be within biologically based limits or to ensure that the UoA does not hinder their recovery.	There is a strategy in place for the UoA for managing main and minor secondary species.
Met?	Yes, IOTC, Wildlife Act, Fisheries Act as well as other international legislations e.g. CITES	(Y/N)	(Y/N)
b	Management strategy evaluation		
Guidepost	The measures are considered likely to work, based on plausible argument (e.g. general experience, theory or comparison with similar UoAs/species).	There is some objective basis for confidence that the measures/partial strategy will work, based on some information directly about the UoA and/or species involved.	Testing supports high confidence that the partial strategy/strategy will work, based on information directly about the UoA and/or species involved.
Met?	Yes	(Y/N)	(Y/N)
c	Management strategy implementation		
Guidepost		There is some evidence that the measures/partial strategy is being implemented successfully .	There is clear evidence that the partial strategy/strategy is being implemented successfully and is achieving its objective as set out in scoring issue (a).
Met?		Yes, Compliance reporting to IOTC, NPOA development	(Y/N)
d	Shark finning		
Guidepost	It is likely that shark finning is not taking place.	It is highly likely that shark finning is not taking place.	There is a high degree of certainty that shark finning is not taking place.
Met?	Yes	(Y/N/Not relevant)	(Y/N/Not relevant)
e	Review of alternative measures to minimize mortality of unwanted catch		

<p>PI 2.2.2</p>	<p>There is a strategy in place for managing secondary species that is designed to maintain or to not hinder rebuilding of secondary species and the UoA regularly reviews and implements measures, as appropriate, to minimize the mortality of unwanted catch.</p>		
	<p>[Scoring issue need not be scored if are no unwanted catches of secondary species]</p>		
<p>Guidepost</p>	<p>There is a review of the potential effectiveness and practicality of alternative measures to minimize UoA-related mortality of unwanted catch of main secondary species.</p>	<p>There is a regular review of the potential effectiveness and practicality of alternative measures to minimize UoA-related mortality of unwanted catch of main secondary species and they are implemented as appropriate.</p>	<p>There is a biennial review of the potential effectiveness and practicality of alternative measures to minimize UoA-related mortality of unwanted catch of all secondary species, and they are implemented, as appropriate.</p>
<p>Met?</p>	<p>Not relevant</p>	<p>(Y/N/Not relevant)</p>	<p>(Y/N/Not relevant)</p>
<p>Overall PI justification</p>	<p>Secondary species management strategies; IOTC, Wildlife Act, Fisheries Act as well as other international legislations e.g. CITES Compliance reporting to IOTC, NPOA development Shark finning unlikely to take place</p>		
<p>References</p>	<p>IOTC reports, Wildlife Act, Fisheries Act, CITES</p>		
		<p>Likely PI Scoring Level (<60, 60-79, ≥ 80)</p>	<p>60-79</p>

Evaluation Table for PI 2.2.3 – Secondary species information

<p>PI 2.2.3</p>	<p>Information on the nature and amount of secondary species taken is adequate to determine the risk posed by the UoA and the effectiveness of the strategy to manage secondary species.</p>		
<p>Scoring Issue</p>	<p>SG 60</p>	<p>SG 80</p>	<p>SG 100</p>
<p>a</p>	<p>Information adequacy for assessment of impacts on main secondary species</p>		
<p>Guidepost</p>	<p>Qualitative information is adequate to estimate the impact of the UoA on the main secondary species with respect to status. OR If RBF is used to score PI 2.2.1 for the UoA: Qualitative information is adequate to estimate productivity and susceptibility attributes</p>	<p>Some quantitative information is available and adequate to assess the impact of the UoA on main secondary species with respect to status. OR If RBF is used to score PI 2.2.1 for the UoA: Some quantitative information is adequate to assess productivity and susceptibility attributes for main secondary species.</p>	<p>Quantitative information is available and adequate to assess with a high degree of certainty the impact of the UoA on main secondary species with respect to status.</p>

PI 2.2.3		Information on the nature and amount of secondary species taken is adequate to determine the risk posed by the UoA and the effectiveness of the strategy to manage secondary species.		
		for main secondary species.		
	Met?	Yes, RBF done by IOTC	(Y/N)	(Y/N)
b Information adequacy for assessment of impacts on minor secondary species				
	Guidepost			Some quantitative information is adequate to estimate the impact of the UoA on minor secondary species with respect to status.
	Met?			Not relevant
c Information adequacy for management strategy				
	Guidepost	Information is adequate to support measures to manage main secondary species.	Information is adequate to support a partial strategy to manage main secondary species.	Information is adequate to support a strategy to manage all secondary species, and evaluate with a high degree of certainty whether the strategy is achieving its objective .
	Met?	No	(Y/N)	(Y/N)
Overall PI justification		RBF done by IOTC Information to support measures for main secondary species is lacking		
References		IOTC reports		
			Likely PI Scoring Level (<60, 60-79, ≥ 80)	<60

Evaluation Table for PI 2.3.1 – ETP species outcome

PI 2.3.1		The UoA meets national and international requirements for the protection of ETP species The UoA does not hinder recovery of ETP species		
Scoring Issue		SG 60	SG 80	SG 100
a	Effects of the UoA on population/stock within national or international limits, where applicable [Scoring issue need not be scored if there are no national or international requirements that set limits for ETP species].			
	Guidepost	Where national and/or international requirements set limits for ETP species, the effects of the UoA on the population/stock are known and likely to be within these limits.	Where national and/or international requirements set limits for ETP species, the combined effects of the MSC UoAs on the population/stock are known and highly likely to be within these limits.	Where national and/or international requirements set limits for ETP species, there is a high degree of certainty that the combined effects of the MSC UoAs are within these limits.

PI 2.3.1		The UoA meets national and international requirements for the protection of ETP species The UoA does not hinder recovery of ETP species		
	Met?	Effects of the UoA on the population/stock are known and likely to be within these limits are unknown	(Y/N/Not relevant)	(Y/N/Not relevant)
b	Direct effects			
	Guidepost	Known direct effects of the UoA are likely to not hinder recovery of ETP species.	Known direct effects of the UoA are highly likely to not hinder recovery of ETP species.	There is a high degree of confidence that there are no significant detrimental direct effects of the UoA on ETP species.
	Met?	Effects are unknown	(Y/N)	(Y/N)
c	Indirect effects			
	Guidepost		Indirect effects have been considered and are thought to be highly likely to not create unacceptable impacts.	There is a high degree of confidence that there are no significant detrimental indirect effects of the fishery on ETP species.
	Met?		Effects are unknown	(Y/N)
Overall PI justification		Effects are unknown Scanty information on this More research needs to be done		
References		IOTC reports 2017		
RBF Required? (✓/✗/)		X	Likely PI Scoring Level (<60, 60-79,)	<60

Evaluation Table for PI 2.3.2 – ETP species management strategy

PI 2.3.2		The UoA has in place precautionary management strategies designed to: <ul style="list-style-type: none"> • meet national and international requirements; • Ensure the UoA does not hinder recovery of ETP species. Also, the UoA regularly reviews and implements measures, as appropriate, to minimize the mortality of ETP species.		
Scoring Issue		SG 60	SG 80	SG 100
a	Management strategy in place (national and international requirements) [Scoring issue need not be scored if <u>there are no</u> requirements for protection or rebuilding provided through national ETP legislation or international agreements].			
	Guidepost	There are measures in place that minimize the UoA-related mortality of ETP species, and are expected to be highly likely to achieve national and international requirements for the	There is a strategy in place for managing the UoA’s impact on ETP species, including measures to minimize mortality, which is designed to be highly likely to achieve national and international	There is a comprehensive strategy in place for managing the UoA’s impact on ETP species, including measures to minimize mortality, which is designed to achieve above national and international requirements

<p>PI 2.3.2</p>	<p>The UoA has in place precautionary management strategies designed to:</p> <ul style="list-style-type: none"> • meet national and international requirements; • Ensure the UoA does not hinder recovery of ETP species. <p>Also, the UoA regularly reviews and implements measures, as appropriate, to minimize the mortality of ETP species.</p>			
		<p>protection of ETP species.</p>	<p>requirements for the protection of ETP species.</p>	<p>for the protection of ETP species.</p>
	<p>Met?</p>	<p>Yes, general measures not specific to the UOA (national legislation) MPAs</p>	<p>(Y/N/Not relevant)</p>	<p>(Y/N/Not relevant)</p>
<p>b</p>	<p>Management strategy in place (alternative)</p>			
	<p>[Scoring issue need not be scored if there are requirements for protection or rebuilding provided through national ETP legislation or international agreements].</p>			
	<p>Guidepost</p>	<p>There are measures in place that are expected to ensure the UoA does not hinder the recovery of ETP species.</p>	<p>There is a strategy in place that is expected to ensure the UoA does not hinder the recovery of ETP species.</p>	<p>There is a comprehensive strategy in place for managing ETP species, to ensure the UoA does not hinder the recovery of ETP species</p>
	<p>Met?</p>	<p>(Y/N/Not relevant)</p>	<p>(Y/N/Not relevant)</p>	<p>YES, comprehensive measures are in place: - - sea turtle strategy - Sea turtle Action plan - Wildlife Act, on ETPs - Fisheries Act - IPOAs etc.</p>
<p>c</p>	<p>Management strategy evaluation</p>			
	<p>Guidepost</p>	<p>The measures are considered likely to work, based on plausible argument (e.g. general experience, theory or comparison with similar fisheries/species).</p>	<p>There is an objective basis for confidence that the measures/strategy will work, based on information directly about the fishery and/or the species involved.</p>	<p>The strategy/comprehensive strategy is mainly based on information directly about the fishery and/or species involved, and a quantitative analysis supports high confidence that the strategy will work.</p>
	<p>Met?</p>	<p>Yes the existing legislative structures will work based on information from other fisheries such as the trawls, purse seines and other fisheries etc</p>	<p>(Y/N)</p>	<p>(Y/N)</p>
<p>d</p>	<p>Management strategy implementation</p>			
	<p>Guidepost</p>		<p>There is some evidence that the measures/strategy</p>	<p>There is clear evidence that the strategy/comprehensive</p>

<p>PI 2.3.2</p>	<p>The UoA has in place precautionary management strategies designed to:</p> <ul style="list-style-type: none"> • meet national and international requirements; • Ensure the UoA does not hinder recovery of ETP species. <p>Also, the UoA regularly reviews and implements measures, as appropriate, to minimize the mortality of ETP species.</p>			
			<p>is being implemented successfully.</p>	<p>strategy is being implemented successfully and is achieving its objective as set out in scoring issue (a) or (b).</p>
	<p>Met?</p>		<p>NO, no evidence available for measures being implemented specific to the fishery</p>	<p>(Y/N)</p>
<p>e</p>	<p>Review of alternative measures to minimize mortality of ETP species</p>			
	<p>Guidepost</p>	<p>There is a review of the potential effectiveness and practicality of alternative measures to minimize UoA-related mortality of ETP species.</p>	<p>There is a regular review of the potential effectiveness and practicality of alternative measures to minimize UoA-related mortality of ETP species and they are implemented as appropriate.</p>	<p>There is a biennial review of the potential effectiveness and practicality of alternative measures to minimize UoA-related mortality ETP species, and they are implemented, as appropriate.</p>
	<p>Met?</p>	<p>No structured review of the UOA related ETP mortalities</p>	<p>(Y/N)</p>	<p>(Y/N)</p>
<p>Overall PI justification</p>	<p>General fisheries regulations are in place within the Fisheries Act, some are proposed in the Ring net management plan, however, fishery specific measures have not been put in place. Comprehensive measures are in place: - - sea turtle strategy - Sea turtle Action plan - Wildlife Act, on ETPs - Fisheries Act - IPOAs etc. The existing legislative structures will work based on information from other fisheries such as the trawls, purse seines and other fisheries etc General measures not specific to the UOA (national legislation) MPAs No evidence that measures are being implemented successfully No structured review of the UOA related ETP mortalities</p>			
<p>References</p>	<p>IOTC reports; Wildlife act; Fisheries management and Development Act</p>			

<p>Likely PI Scoring Level (<60, 60-79, ≥ 80)</p>	<p><60</p>
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Evaluation Table for PI 2.3.3 – ETP species information

PI 2.3.3	Relevant information is collected to support the management of UoA impacts on ETP species, including: <ul style="list-style-type: none"> Information for the development of the management strategy; Information to assess the effectiveness of the management strategy; and Information to determine the outcome status of ETP species. 		
Scoring Issue	SG 60	SG 80	SG 100
a	Information adequacy for assessment of impacts		
Guidepost	Qualitative information is adequate to estimate the UoA related mortality on ETP species. OR If RBF is used to score PI 2.3.1 for the UoA: Qualitative information is adequate to estimate productivity and susceptibility attributes for ETP species.	Some quantitative information is adequate to assess the UoA related mortality and impact and to determine whether the UoA may be a threat to protection and recovery of the ETP species. OR If RBF is used to score PI 2.3.1 for the UoA: Some quantitative information is adequate to assess productivity and susceptibility attributes for ETP species.	Quantitative information is available to assess with a high degree of certainty the magnitude of UoA-related impacts, mortalities and injuries and the consequences for the status of ETP species.
Met?	Information is not adequate	(Y/N)	(Y/N)
b	Information adequacy for management strategy		
Guidepost	Information is adequate to support measures to manage the impacts on ETP species.	Information is adequate to measure trends and supports a strategy to manage impacts on ETP species.	Information is adequate to support a comprehensive strategy to manage impacts, minimize mortality and injury of ETP species, and evaluate with a high degree of certainty whether a strategy is achieving its objectives.
Met?	Information is not adequate	(Y/N)	(Y/N)
Overall PI justification	Information is not adequate for assessment and for supporting measures to manage impacts on ETPs		
References	Sea turtle strategy Sea turtle Action plan Kenya Wildlife Act, on ETPs Fisheries Management and Development Act of 2016 IPOAs		
		Likely PI Scoring Level (<60, 60-79, ≥ 80)	<60

Evaluation Table for PI 2.4.1 – Habitats outcome (open waters)

PI 2.4.1	The UoA does not cause serious or irreversible harm to habitat structure and function, considered on the basis of the area covered by the governance body(s) responsible for fisheries management in the area(s) where the UoA operates.		
Scoring Issue	SG 60	SG 80	SG 100
a	Commonly encountered habitat status		
Guidepost	The UoA is unlikely to reduce structure and function of the commonly encountered habitats to a point where there would be serious or irreversible harm.	The UoA is highly unlikely to reduce structure and function of the commonly encountered habitats to a point where there would be serious or irreversible harm.	There is evidence that the UoA is highly unlikely to reduce structure and function of the commonly encountered habitats to a point where there would be serious or irreversible harm.
Met?	(Y/N)	The UoA operates in pelagic waters and is thus highly unlikely to negatively impact any encountered habitat	(Y/N)
b	VME habitat status [Scoring issue need not be scored if there are no VMEs].		
Guidepost	The UoA is unlikely to reduce structure and function of the VME habitats to a point where there would be serious or irreversible harm.	The UoA is highly unlikely to reduce structure and function of the VME habitats to a point where there would be serious or irreversible harm.	There is evidence that the UoA is highly unlikely to reduce structure and function of the VME habitats to a point where there would be serious or irreversible harm.
Met?	(Y/N/Not relevant)	The UoA operates in pelagic waters and is thus highly unlikely to negatively impact any encountered habitat	(Y/N/Not relevant)
c	Minor habitat status		
Guidepost			There is evidence that the UoA is highly unlikely to reduce structure and function of the minor habitats to a point where there would be serious or irreversible harm.
Met?			There is indirect knowledge (expert and anecdotal) based on the gear deployment, but quantitative information is lacking.

PI 2.4.1	The UoA does not cause serious or irreversible harm to habitat structure and function, considered on the basis of the area covered by the governance body(s) responsible for fisheries management in the area(s) where the UoA operates.		
Overall PI justification	The UoA operates in pelagic waters and is thus highly unlikely to negatively impact any encountered habitat There is indirect knowledge (expert and anecdotal) based on the gear deployment, but quantitative information is lacking		
References	IOTC reports		
RBF Required? (✓/×/)	✓, RBF Required	Likely PI Scoring Level (<60, 60-79, ≥ 80)	60-79

Evaluation Table for PI 2.4.2 – Habitats management strategy

PI 2.4.2	There is a strategy in place that is designed to ensure the UoA does not pose a risk of serious or irreversible harm to the habitats.		
Scoring Issue	SG 60	SG 80	SG 100
a	Management strategy in place		
Guidepost	There are measures in place, if necessary, that are expected to achieve the Habitat Outcome 80 level of performance.	There is a partial strategy in place, if necessary, that is expected to achieve the Habitat Outcome 80 level of performance or above.	There is a strategy in place for managing the impact of all MSC UoAs/non-MSC fisheries on habitats.
Met?	Not relevant	(Y/N)	(Y/N)
b	Management strategy evaluation		
Guidepost	The measures are considered likely to work, based on plausible argument (e.g. general experience, theory or comparison with similar UoAs/habitats).	There is some objective basis for confidence that the measures/partial strategy will work, based on information directly about the UoA and/or habitats involved.	Testing supports high confidence that the partial strategy/strategy will work, based on information directly about the UoA and/or habitats involved.
Met?	Not relevant	(Y/N)	(Y/N)
c	Management strategy implementation		
Guidepost		There is some quantitative evidence that the measures/partial strategy is being implemented successfully.	There is clear quantitative evidence that the partial strategy/strategy is being implemented successfully and is achieving its objective, as outlined in scoring issue (a).
Met?		Not relevant	(Y/N)
d	Compliance with management requirements and other MSC UoAs'/non-MSC fisheries' measures to protect VMEs [Scoring issue need not be scored if there are no VMEs].		
Guidepost	There is qualitative evidence that the UoA complies with its	There is some quantitative evidence that the UoA complies with both its	There is clear quantitative evidence that the UoA complies with both its

PI 2.4.2		There is a strategy in place that is designed to ensure the UoA does not pose a risk of serious or irreversible harm to the habitats.		
		management requirements to protect VMEs.	management requirements and with protection measures afforded to VMEs by other MSC UoAs/non-MSC fisheries, where relevant.	management requirements and with protection measures afforded to VMEs by other MSC UoAs/non-MSC fisheries, where relevant.
	Met?	Not relevant, based on the gear operation	(Y/N/Not relevant)	(Y/N/Not relevant)
Overall PI justification		No habitat management strategy		
References		[List any references here]		
			Likely PI Scoring Level (<60, 60-79, ≥ 80)	NOT RELEVANT

Evaluation Table for PI 2.4.3 – Habitats information

PI 2.4.3		Information is adequate to determine the risk posed to the habitat by the UoA and the effectiveness of the strategy to manage impacts on the habitat.		
Scoring Issue		SG 60	SG 80	SG 100
a	Information quality			
	Guidepost	The types and distribution of the main habitats are broadly understood . OR If CSA is used to score PI 2.4.1 for the UoA: Qualitative information is adequate to estimate the types and distribution of the main habitats.	The nature, distribution and vulnerability of the main habitats in the UoA area are known at a level of detail relevant to the scale and intensity of the UoA. OR If CSA is used to score PI 2.4.1 for the UoA: Some quantitative information is available and is adequate to estimate the types and distribution of the main habitats.	The distribution of all habitats is known over their range, with particular attention to the occurrence of vulnerable habitats.
	Met?	YES, habitat distribution broadly understood, some mapping done	(Y/N)	
b	Information adequacy for assessment of impacts			
	Guidepost	Information is adequate to broadly understand the nature	Information is adequate to allow for identification of the main impacts of the	The physical impacts of the gear on all habitats have been quantified fully.

PI 2.4.3		Information is adequate to determine the risk posed to the habitat by the UoA and the effectiveness of the strategy to manage impacts on the habitat.		
		of the main impacts of gear use on the main habitats, including spatial overlap of habitat with fishing gear. OR If CSA is used to score PI 2.4.1 for the UoA: Qualitative information is adequate to estimate the consequence and spatial attributes of the main habitats.	UoA on the main habitats, and there is reliable information on the spatial extent of interaction and on the timing and location of use of the fishing gear. OR If CSA is used to score PI 2.4.1 for the UoA: Some quantitative information is available and is adequate to estimate the consequence and spatial attributes of the main habitats.	
	Met?	There is adequate qualitative information	(Y/N)	(Y/N)
c	Monitoring			
	Guidepost		Adequate information continues to be collected to detect any increase in risk to the main habitats.	Changes in habitat distributions over time are measured.
	Met?		Yes, although no monitoring currently on going. Previous studies on habitats conducted, overlap maps of the fishery undertaken	(Y/N)
Overall PI justification		Habitat distribution broadly understood, some mapping done habitat distribution broadly understood, some mapping done Ref: Thoya et al Although no monitoring currently on going. Previous studies on habitats conducted, overlap maps of the fishery undertaken		
References		Thoya et al , KMFRI Biodiversity reports; Painter, Cortes and Engels, 2001		
			Likely PI Scoring Level (<60, 60-79, ≥ 80)	60-79

Evaluation Table for PI 2.5.1 – Ecosystem outcome

PI 2.5.1		The UoA does not cause serious or irreversible harm to the key elements of ecosystem structure and function.		
Scoring Issue		SG 60	SG 80	SG 100
a	Ecosystem status			
	Guidepost	The UoA is unlikely to disrupt the key elements underlying ecosystem structure	The UoA is highly unlikely to disrupt the key elements underlying ecosystem structure and	There is evidence that the UoA is highly unlikely to disrupt the key elements underlying ecosystem

PI 2.5.1	The UoA does not cause serious or irreversible harm to the key elements of ecosystem structure and function.		
	and function to a point where there would be a serious or irreversible harm.	function to a point where there would be a serious or irreversible harm.	structure and function to a point where there would be a serious or irreversible harm.
Met?	(Y/N/Partial)	Yes, scale of the fishery is Kenya is very small	(Y/N/Partial)
Overall PI justification	Yes, scale of the fishery is Kenya is very small		
References	KMFRI Biodiversity reports		
RBF Required? (✓/×/)	X	Likely PI Scoring Level (<60, 60-79, ≥ 80)	≥ 80

Evaluation Table for PI 2.5.2 – Ecosystem management strategy

PI 2.5.2	There are measures in place to ensure the UoA does not pose a risk of serious or irreversible harm to ecosystem structure and function.		
Scoring Issue	SG 60	SG 80	SG 100
a	Management strategy in place		
Guidepost	There are measures in place, if necessary which take into account the potential impacts of the fishery on key elements of the ecosystem.	There is a partial strategy in place, if necessary, which takes into account available information and is expected to restrain impacts of the UoA on the ecosystem so as to achieve the Ecosystem Outcome 80 level of performance.	There is a strategy that consists of a plan , in place which contains measures to address all main impacts of the UoA on the ecosystem, and at least some of these measures are in place.
Met?	Yes, Kenya Tuna Fisheries Development and Management Strategy 2013-2018, General fisheries regulations	(Y/N)	(Y/N)
b	Management strategy evaluation		
Guidepost	The measures are considered likely to work, based on plausible argument (e.g., general experience, theory or comparison with similar fisheries/ ecosystems).	There is some objective basis for confidence that the measures/partial strategy will work, based on some information directly about the UoA and/or the ecosystem involved	Testing supports high confidence that the partial strategy/strategy will work, based on information directly about the UoA and/or ecosystem involved
Met?	Yes	(Y/N)	(Y/N)
c	Management strategy implementation		
Guidepost		There is some evidence that the measures/partial	There is clear evidence that the partial strategy/strategy is being

PI 2.5.2	There are measures in place to ensure the UoA does not pose a risk of serious or irreversible harm to ecosystem structure and function.		
		strategy is being implemented successfully.	implemented successfully and is achieving its objective as set out in scoring issue (a).
	Met?	Yes, National tuna dialogue meeting reports	(Y/N)
Overall PI justification	There are measures to ensure the Fishery does not pose irreversible harm to ecosystem structure and function; the Kenya Tuna Fisheries Development and Management Strategy 2013-2018, General fisheries regulations Measures are considered likely to work, based on plausible argument National tuna dialogue meeting reports show partial measures		
References	Kenya Tuna Fisheries Development and Management Strategy 2013-2018; IOTC reports; Fisheries Management and Development Act 2016		
		Likely PI Scoring Level (<60, 60-79, ≥ 80)	60-79

Evaluation Table for PI 2.5.3 – Ecosystem information

PI 2.5.3	There is adequate knowledge of the impacts of the UoA on the ecosystem.		
Scoring Issue	SG 60	SG 80	SG 100
a	Information quality		
	Guidepost	Information is adequate to identify the key elements of the ecosystem.	Information is adequate to broadly understand the key elements of the ecosystem.
	Met?	Yes, information is adequate	(Y/N)
b	Investigation of UoA impacts		
	Guidepost	Main impacts of the UoA on these key ecosystem elements can be inferred from existing information, but have not been investigated in detail.	Main impacts of the UoA on these key ecosystem elements can be inferred from existing information, and some have been investigated in detail .
	Met?	Yes	(Y/N)
c	Understanding of component functions		
	Guidepost	The main functions of the components (i.e., PI target species, primary, secondary and ETP species and Habitats) in the ecosystem are known .	The impacts of the UoA on PI target species, primary, secondary and ETP species and Habitats are identified and the main functions of these components in the ecosystem are understood .
	Met?	Yes, readily available e.g. on Fishbase	(Y/N)
d	Information relevance		

PI 2.5.3		There is adequate knowledge of the impacts of the UoA on the ecosystem.		
	Guidepost		Adequate information is available on the impacts of the UoA on these components to allow some of the main consequences for the ecosystem to be inferred.	Adequate information is available on the impacts of the UoA on the components and elements to allow the main consequences for the ecosystem to be inferred.
	Met?		Information is not adequate on impacts of the UoA	(Y/N)
e	Monitoring			
	Guidepost		Adequate data continue to be collected to detect any increase in risk level.	Information is adequate to support the development of strategies to manage ecosystem impacts.
	Met?		No	(Y/N)
Overall PI justification		Information is adequate to identify the key elements of the ecosystem The main functions of the components in the ecosystem are known e.g. on Fishbase Information is not adequate on impacts of the UoA No adequate data continue to be collected to detect any increase in risk level		
References				
			Likely PI Scoring Level (<60, 60-79, ≥ 80)	<60

Principle 3 Effective and Responsible Management

Evaluation Table for PI 3.1.1 – Legal and/or customary framework

PI 3.1.1	The management system exists within an appropriate legal and/or customary framework which ensures that it: <ul style="list-style-type: none"> • Is capable of delivering sustainability in the UoA(s); and • Observes the legal rights created explicitly or established by custom of people dependent on fishing for food or livelihood; and • Incorporates an appropriate dispute resolution framework. 			
Scoring Issue	SG 60	SG 80	SG 100	
a	Compatibility of laws or standards with effective management			
	Guidepost	There is an effective national legal system and a framework for cooperation with other parties, where necessary, to deliver management outcomes consistent with MSC Principles 1 and 2	There is an effective national legal system and organised and effective cooperation with other parties, where necessary, to deliver management outcomes consistent with MSC Principles 1 and 2.	There is an effective national legal system and binding procedures governing cooperation with other parties which delivers management outcomes consistent with MSC Principles 1 and 2.
	Met?	(Y/N)	(Y/N)	Yes
b	Resolution of disputes			
	Guidepost	The management system incorporates or	The management system incorporates or is subject	The management system incorporates or is subject

PI 3.1.1		<p>The management system exists within an appropriate legal and/or customary framework which ensures that it:</p> <ul style="list-style-type: none"> Is capable of delivering sustainability in the UoA(s); and Observes the legal rights created explicitly or established by custom of people dependent on fishing for food or livelihood; and Incorporates an appropriate dispute resolution framework. 		
		is subject by law to a mechanism for the resolution of legal disputes arising within the system.	by law to a transparent mechanism for the resolution of legal disputes which is considered to be effective in dealing with most issues and that is appropriate to the context of the UoA.	by law to a transparent mechanism for the resolution of legal disputes that is appropriate to the context of the fishery and has been tested and proven to be effective .
	Met?	(Y/N)	Yes	(Y/N)
c				
Respect for rights				
	Guidepost	The management system has a mechanism to generally respect the legal rights created explicitly or established by custom of people dependent on fishing for food or livelihood in a manner consistent with the objectives of MSC Principles 1 and 2.	The management system has a mechanism to observe the legal rights created explicitly or established by custom of people dependent on fishing for food or livelihood in a manner consistent with the objectives of MSC Principles 1 and 2.	The management system has a mechanism to formally commit to the legal rights created explicitly or established by custom of people dependent on fishing for food and livelihood in a manner consistent with the objectives of MSC Principles 1 and 2.
	Met?	(Y/N)	(Y/N)	Yes
Overall PI justification		<p>The management system exists within an appropriate legal and/or customary framework which ensures that it:</p> <ul style="list-style-type: none"> Is capable of delivering sustainability in the UoA(s); and Observes the legal rights created explicitly or established by custom of people dependent on fishing for food or livelihood; and <p>Incorporates an appropriate dispute resolution framework</p>		
References		Fisheries management and development act, 2016		
				<p>Likely PI Scoring Level (<60, 60-79, ≥ 80)</p> <p style="font-size: 24pt; font-weight: bold;">≥ 80</p>

Evaluation Table for PI 3.1.2 – Consultation, roles and responsibilities

PI 3.1.2		<p>The management system has effective consultation processes that are open to interested and affected parties.</p> <p>The roles and responsibilities of Organizations and individuals who are involved in the management process are clear and understood by all relevant parties</p>		
Scoring Issue		SG 60	SG 80	SG 100
a				
Roles and responsibilities				
	Guidepost	Organizations and individuals involved in the management	Organizations and individuals involved in the management process have	Organizations and individuals involved in the management process have

<p>PI 3.1.2</p>	<p>The management system has effective consultation processes that are open to interested and affected parties. The roles and responsibilities of Organizations and individuals who are involved in the management process are clear and understood by all relevant parties</p>		
	<p>process have been identified. Functions, roles and responsibilities are generally understood.</p>	<p>been identified. Functions, roles and responsibilities are explicitly defined and well understood for key areas of responsibility and interaction.</p>	<p>been identified. Functions, roles and responsibilities are explicitly defined and well understood for all areas of responsibility and interaction.</p>
<p>Met?</p>	<p>(Y/N)</p>	<p>(Y/N)</p>	<p>Yes</p>
<p>b</p>	<p>Consultation processes</p>		
<p>Guidepost</p>	<p>The management system includes consultation processes that obtain relevant information from the main affected parties, including local knowledge, to inform the management system.</p>	<p>The management system includes consultation processes that regularly seek and accept relevant information, including local knowledge. The management system demonstrates consideration of the information obtained.</p>	<p>The management system includes consultation processes that regularly seek and accept relevant information, including local knowledge. The management system demonstrates consideration of the information and explains how it is used or not used.</p>
<p>Met?</p>	<p>(Y/N)</p>	<p>Yes</p>	<p>(Y/N)</p>
<p>c</p>	<p>Participation</p>		
<p>Guidepost</p>		<p>The consultation process provides opportunity for all interested and affected parties to be involved.</p>	<p>The consultation process provides opportunity and encouragement for all interested and affected parties to be involved, and facilitates their effective engagement.</p>
<p>Met?</p>		<p>(Y/N)</p>	<p>Yes</p>
<p>Overall PI justification</p>	<p>Organizations and individuals involved in the management process have been identified The management system includes consultation processes that regularly seek and accept relevant information, including local knowledge The consultation process provides opportunity and encouragement for all</p>		
<p>References</p>	<p>Stakeholder consultation minutes</p>		
<p>Likely PI Scoring Level (<60, 60-79, ≥ 80)</p>		<p>≥ 80</p>	

Evaluation Table for PI 3.1.3 – Long term objectives

PI 3.1.3	The management policy has clear long-term objectives to guide decision-making that are consistent with MSC fisheries standard, and incorporates the precautionary approach.		
Scoring Issue	SG 60	SG 80	SG 100
a	Objectives		
	Guidepost	Long-term objectives to guide decision-making, consistent with the MSC fisheries standard and the precautionary approach, are implicit within management policy.	Clear long-term objectives that guide decision-making, consistent with MSC fisheries standard and the precautionary approach are explicit within management policy.
	Met?	(Y/N/Partial)	Yes
Overall PI justification	The management policy has clear long-term objectives to guide decision-making that are consistent with MSC fisheries standard Management incorporates precautionary principle		
References	General Fisheries regulations; Fisheries management and development act, 2016; ICZM;		
	Likely PI Scoring Level (<60, 60-79, ≥ 80)		≥ 80

Evaluation Table for PI 3.2.1 Fishery-specific objectives

PI 3.2.1	The fishery-specific management system has clear, specific objectives designed to achieve the outcomes expressed by MSC's Principles 1 and 2.		
Scoring Issue	SG 60	SG 80	SG 100
a	Objectives		
	Guidepost	Objectives, which are broadly consistent with achieving the outcomes expressed by MSC's Principles 1 and 2, are implicit within the fishery-specific management system.	Short and long-term objectives, which are consistent with achieving the outcomes expressed by MSC's Principles 1 and 2, are explicit within the fishery-specific management system.
	Met?	Yes	(Y/N/Partial)
Overall PI justification	The fishery-specific management system has clear, specific objectives		
References	Tuna development and management strategy 2013-2018		
	Likely PI Scoring Level (<60, 60-79, ≥ 80)		60-79

Evaluation Table for PI 3.2.2 – Decision-making processes

PI 3.2.2	The fishery-specific management system includes effective decision-making processes that result in measures and strategies to achieve the objectives, and has an appropriate approach to actual disputes in the fishery.		
Scoring Issue	SG 60	SG 80	SG 100
a	Decision-making processes		
Guidepost	There are some decision-making processes in place that result in measures and strategies to achieve the fishery-specific objectives.	There are established decision-making processes that result in measures and strategies to achieve the fishery-specific objectives.	
Met?	Yes	(Y/N)	
b	Responsiveness of decision-making processes		
Guidepost	Decision-making processes respond to serious issues identified in relevant research, monitoring, evaluation and consultation, in a transparent, timely and adaptive manner and take some account of the wider implications of decisions.	Decision-making processes respond to serious and other important issues identified in relevant research, monitoring, evaluation and consultation, in a transparent, timely and adaptive manner and take account of the wider implications of decisions.	Decision-making processes respond to all issues identified in relevant research, monitoring, evaluation and consultation, in a transparent, timely and adaptive manner and take account of the wider implications of decisions.
Met?	Yes	(Y/N)	(Y/N)
c	Use of precautionary approach		
Guidepost		Decision-making processes use the precautionary approach and are based on best available information.	
Met?		Yes	
d	Accountability and transparency of management system and decision-making process		
Guidepost	Some information on the fishery's performance and management action is generally available on request to stakeholders.	Information on the fishery's performance and management action is available on request , and explanations are provided for any actions or lack of action associated with findings and relevant recommendations emerging from research, monitoring, evaluation and review activity.	Formal reporting to all interested stakeholders provides comprehensive information on the fishery's performance and management actions and describes how the management system responded to findings and relevant recommendations emerging from research, monitoring, evaluation and review activity.
Met?	(Y/N)	Yes	(Y/N)

PI 3.2.2		The fishery-specific management system includes effective decision-making processes that result in measures and strategies to achieve the objectives, and has an appropriate approach to actual disputes in the fishery.		
e	Approach to disputes			
	Guidepost	Although the management authority or fishery may be subject to continuing court challenges, it is not indicating a disrespect or defiance of the law by repeatedly violating the same law or regulation necessary for the sustainability for the fishery.	The management system or fishery is attempting to comply in a timely fashion with judicial decisions arising from any legal challenges.	The management system or fishery acts proactively to avoid legal disputes or rapidly implements judicial decisions arising from legal challenges.
	Met?	(Y/N)	(Y/N)	Yes
Overall PI justification		<p>There are some decision-making processes in place</p> <p>Decision-making processes respond to serious issues identified in relevant research, monitoring, evaluation and consultation</p> <p>Decision-making processes use the precautionary approach</p> <p>Information on the fishery’s performance and management action is available on request</p> <p>The management system or fishery acts proactively</p>		
References		IOTC reports and general fisheries regulations; Tuna management and development strategy 2013-2018		
			Likely PI Scoring Level (<60, 60-79, ≥ 80)	60-79

Evaluation Table for PI 3.2.3 – Compliance and enforcement

PI 3.2.3		Monitoring, control and surveillance mechanisms ensure the management measures in the fishery are enforced and complied with.		
Scoring Issue		SG 60	SG 80	SG 100
a	MCS implementation			
	Guidepost	Monitoring, control and surveillance mechanisms exist, and are implemented in the fishery and there is a reasonable expectation that they are effective.	A monitoring, control and surveillance system has been implemented in the fishery and has demonstrated an ability to enforce relevant management measures, strategies and/or rules.	A comprehensive monitoring, control and surveillance system has been implemented in the fishery and has demonstrated a consistent ability to enforce relevant management measures, strategies and/or rules.
	Met?	Yes	(Y/N)	(Y/N)
b	Sanctions			
	Guidepost	Sanctions to deal with non-compliance exist	Sanctions to deal with non-compliance exist, are	Sanctions to deal with non-compliance exist, are

PI 3.2.3		Monitoring, control and surveillance mechanisms ensure the management measures in the fishery are enforced and complied with.		
		and there is some evidence that they are applied.	consistently applied and thought to provide effective deterrence.	consistently applied and demonstrably provide effective deterrence.
	Met?	(Y/N)	Yes	(Y/N)
c		Compliance		
	Guidepost	Fishers are generally thought to comply with the management system for the fishery under assessment, including, when required, providing information of importance to the effective management of the fishery.	Some evidence exists to demonstrate fishers comply with the management system under assessment, including, when required, providing information of importance to the effective management of the fishery.	There is a high degree of confidence that fishers comply with the management system under assessment, including, providing information of importance to the effective management of the fishery.
	Met?	Yes	(Y/N)	(Y/N)
d		Systematic non-compliance		
	Guidepost		There is no evidence of systematic non-compliance.	
	Met?		Yes	
Overall PI justification		Monitoring, control and surveillance mechanisms exist, and are effectively implemented in the fishery Sanctions to deal with non-compliance exist, are consistently applied Fishers are generally thought to comply with the management system for the fishery		
References		General Fisheries regulations; IOTC reports, Tuna development and Management strategy		
			Likely PI Scoring Level (<60, 60-79, ≥ 80)	60-79

Evaluation Table for PI 3.2.4 – Monitoring and management performance evaluation

PI 3.2.4		There is a system of monitoring and evaluating the performance of the fishery-specific management system against its objectives. There is effective and timely review of the fishery-specific management system.		
Scoring Issue		SG 60	SG 80	SG 100
a		Evaluation coverage		
	Guidepost	There are mechanisms in place to evaluate some parts of the fishery-specific management system.	There are mechanisms in place to evaluate key parts of the fishery-specific management system	There are mechanisms in place to evaluate all parts of the fishery-specific management system.
	Met?	Yes	(Y/N)	(Y/N)
b		Internal and/or external review		
	Guidepost	The fishery-specific management system is	The fishery-specific management system is	The fishery-specific management system is

PI 3.2.4	There is a system of monitoring and evaluating the performance of the fishery-specific management system against its objectives. There is effective and timely review of the fishery-specific management system.		
	subject to occasional internal review.	subject to regular internal and occasional external review.	subject to regular internal and external review.
Met?	Yes	(Y/N)	(Y/N)
Overall PI justification	There are mechanisms in place to evaluate some parts of the fishery-specific management system The fishery-specific management system is subject to occasional internal review		
References	IOTC reports and the Kenya Tuna development and Management strategy 2013-2018		
	Likely PI Scoring Level (<60, 60-79, ≥ 80)	60-79	

Appendix 6: MSC's BMT Baseline Status & 5-year projections for *T. affinis* & *T. obesus* Fishery

Principle	Component	Performance Indicator	Actual 2019	Expected 2020	Expected 2021	Expected 2022	Expected 2023
1	Outcome	1.1.1 Stock status	≥80	≥80	≥80	≥80	≥80
		1.1.2 Stock rebuilding	---	---	<60	60-79	60-79
	Management	1.2.1 Harvest Strategy	<60	<60	60-79	60-79	≥80
		1.2.2 Harvest control rules and tools	<60	<60	60-79	60-79	≥80
		1.2.3 Information and monitoring	<60	<60	60-79	60-79	≥80
		1.2.4 Assessment of stock status	60-79	60-79	≥80	≥80	≥80
2	Primary species	2.1.1 Outcome	<60	<60	60-79	60-79	≥80
		2.1.2 Management	<60	<60	60-79	60-79	≥80
		2.1.3 Information	<60	60-79	60-79	≥80	≥80
	Secondary species	2.2.1 Outcome	<60	<60	60-79	60-79	60-79
		2.2.2 Management	60-79	60-79	60-79	≥80	≥80
		2.2.3 Information	<60	<60	60-79	60-79	≥80
	ETP species	2.3.1 Outcome	<60	<60	60-79	60-79	60-79
		2.3.2 Management	<60	<60	60-79	60-79	≥80
		2.3.3 Information	<60	60-79	60-79	≥80	≥80
	Habitats	2.4.1 Outcome	60-79	60-79	≥80	≥80	≥80
		2.4.2 Management	---	---	---	---	---
		2.4.3 Information	60-79	60-79	≥80	≥80	≥80
	Ecosystem	2.5.1 Outcome	≥80	≥80	≥80	≥80	≥80
2.5.2 Management		60-79	60-79	≥80	≥80	≥80	
2.5.3 Information		<60	60-79	60-79	60-79	≥80	
3	Governance and Policy	3.1.1 Legal and customary framework	≥80	≥80	≥80	≥80	≥80
		3.1.2 Consultation, roles & responsibilities	≥80	≥80	≥80	≥80	≥80
		3.1.3 Long term objectives	≥80	≥80	≥80	≥80	≥80
	Fishery specific management system	3.2.1 Fishery specific objectives	60-79	60-79	≥80	≥80	≥80
		3.2.2 Decision making processes	60-79	60-79	≥80	≥80	≥80
		3.2.3 Compliance and enforcement	60-79	60-79	60-79	60-79	≥80
		3.2.4 Management performance evaluation	60-79	60-79	≥80	≥80	≥80
Total number of PIs equal to or greater than 80			5	5	12	15	24
Total number of PIs 60-79			9	12	14	12	3
Total number of PIs less than 60			12	9	1	0	0
Overall BMT Index			0.37	0.42	0.70	0.78	0.94

Appendix 7: MSC Pre-assessment Results for the Small-scale Prawn Fishery

Principle 1 Sustainability of exploited fish stocks

Evaluation Table for PI 1.1.1 – Stock status

PI 1.1.1	The stock is at a level which maintains high productivity and has a low probability of recruitment overfishing		
Scoring Issue	SG 60	SG 80	SG 100
a	Stock status relative to recruitment impairment		
Guidepost	It is likely that the stock is above the point where recruitment would be impaired (PRI).	It is highly likely that the stock is above the PRI.	There is a high degree of certainty that the stock is above the PRI.
Met?	Yes, good landings of mature individuals in the shallow waters, but fishers within creeks land mainly juveniles (natural biology of the species?)	(Y/N)	(Y/N)
b	Stock status in relation to achievement of MSY		
Guidepost		The stock is at or fluctuating around a level consistent with MSY.	There is a high degree of certainty that the stock has been fluctuating around a level consistent with MSY or has been above this level over recent years.
Met?		YES, F_{CURR}/F_{MSY} for both P. monodon & P. indicus $>1.0 \approx$ high fishing pressure for both species within inshore waters	(Y/N)
Overall PI justification	<p>-Increased landings of mature individuals in the shallow waters, while lots juveniles landed in the creeks and inshore waters;</p> <p>$-F_{CURR}/F_{MSY}$ for both P. monodon & P. indicus $>1.0 \approx$ high fishing pressure for both species within inshore waters</p> <p>-Inshore fisheries land a lot of juveniles partly attributed to the gears used, and the biology of the species, with juveniles inshore, and mature individuals offshore; call to reduce pressure inshore and extend into the offshore shallow waters for exploitation of the mature/adult stocks</p> <p>-Need to quantify the artisanal landings which are mainly juveniles, with likely high impacts on recruitment levels</p>		
References	Prawn fact sheets; Prawn fishery report, Prawn management plant recommendations		
RBF Required? (✓/✗/)	Not required	Likely PI Scoring Level (<60, 60-79, ≥ 80)	60-79
Stock Status relative to Reference Points			

PI 1.1.1	The stock is at a level which maintains high productivity and has a low probability of recruitment overfishing		
Scoring Issue	SG 60	SG 80	SG 100
	Type of reference point	Value of reference point	Current stock status relative to reference point
Reference point used in scoring stock relative to PRI (SIa)	MSY, F_{MSY} : 1.04, SSB, F_{CURR}	$F_{CURR-Monodon}$: 1.09 $F_{MSY\ monodon}$: 1.04 $F_{CURR-indicus}$: 2.54 $F_{MSY\ indicus}$: 0.9 $SSB/R_{MSY\ monodon}$: 0.135 $SSB/R_{MSY\ indicus}$: 0.139	$F_{CURR}/F_{MSY-monodon}$: 1.048 $F_{CURR}/F_{MSY-indicus}$: 2.822
Reference point used in scoring stock relative to MSY (SIb)	YPR_{MSY} , Y/R_{MSY} Exploitation rate (F/Z)	$YPR_{MSY-indicus}$: 0.264 $YPR_{CURR-indicus}$: 0.263 $YPR_{MSY\ monodon}$: 0.23 $YPR_{CURR-Monodon}$: 0.23	[Include current stock status in the same units as the reference point e.g. $90,000/B_{MSY}=0.9$]

Evaluation Table for PI 1.1.1A - key LTL [NOTE: only use this table for stocks identified as key LTL]

PI 1.1.1 A	The stock is at a level which has a low probability of serious ecosystem impacts		
Scoring Issue	SG 60	SG 80	SG 100
a	Stock status relative to ecosystem impairment		
Guidepost	It is likely that the stock is above the point where serious ecosystem impacts could occur.	It is highly likely that the stock is above the point where serious ecosystem impacts could occur.	There is a high degree of certainty that the stock is above the point where serious ecosystem impacts could occur.
Met?	(Y/N)	(Y/N)	(Y/N)
b	Stock status in relation to ecosystem needs		
Guidepost		The stock is at or fluctuating around a level consistent with ecosystem needs.	There is a high degree of certainty that the stock has been fluctuating around a level consistent with ecosystem needs or has been above this level over recent years.
Met?		(Y/N)	(Y/N)
Overall PI justification	N/A		
References	N/A		
RBF Required? (✓/✗/)	N/A	Likely PI Scoring Level (<60, 60-79, ≥ 80)	NO SCORE
Stock Status relative to Reference Points			
	Type of reference point	Value of reference point	Current stock status relative to reference point
Reference point used in scoring stock relative to	[e.g. $B_{35\%}$]	[Include value specifying units. e.g. 50,000t total stock biomass]	[Include current stock status in the same units as the reference point e.g. $90,000/B_{35\%}=1.8$]

PI 1.1.1 A	The stock is at a level which has a low probability of serious ecosystem impacts		
Scoring Issue	SG 60	SG 80	SG 100
a	Stock status relative to ecosystem impairment		
Guidepost	It is likely that the stock is above the point where serious ecosystem impacts could occur.	It is highly likely that the stock is above the point where serious ecosystem impacts could occur.	There is a high degree of certainty that the stock is above the point where serious ecosystem impacts could occur.
Met?	(Y/N)	(Y/N)	(Y/N)
b	Stock status in relation to ecosystem needs		
Guidepost		The stock is at or fluctuating around a level consistent with ecosystem needs.	There is a high degree of certainty that the stock has been fluctuating around a level consistent with ecosystem needs or has been above this level over recent years.
Met?		(Y/N)	(Y/N)
Overall PI justification	N/A		
References	N/A		
ecosystem impairment (SIa)			
Reference point used in scoring stock relative to ecosystem needs (SIb)	[e.g. B _{75%}]	[Include value specifying units. e.g. 100,000t total stock biomass]	[Include current stock status in the same units as the reference point e.g. 90,000/B _{75%} =0.9]

Evaluation Table for PI 1.1.2 – Stock rebuilding

PI 1.1.2	Where the stock is reduced, there is evidence of stock rebuilding within a specified timeframe		
Scoring Issue	SG 60	SG 80	SG 100
a	Rebuilding timeframes		
Guidepost	A rebuilding timeframe is specified for the stock that is the shorter of 20 years or 2 times its generation time . For cases where 2 generations is less than 5 years, the rebuilding timeframe is up to 5 years.		The shortest practicable rebuilding timeframe is specified which does not exceed one generation time for the stock.

PI 1.1.2		Where the stock is reduced, there is evidence of stock rebuilding within a specified timeframe		
	Met?	Yes; there is a 5-month closure of the industrial prawn fishery for stock recovery, but the inshore creek fisheries are not managed		(Y/N)
b	Rebuilding evaluation			
	Guidepost	Monitoring is in place to determine whether the rebuilding strategies are effective in rebuilding the stock within the specified timeframe.	There is evidence that the rebuilding strategies are rebuilding stocks, or it is likely based on simulation modelling, exploitation rates or previous performance that they will be able to rebuild the stock within the specified timeframe.	There is strong evidence that the rebuilding strategies are rebuilding stocks, or it is highly likely based on simulation modelling, exploitation rates or previous performance that they will be able to rebuild the stock within the specified timeframe.
	Met?	Yes, general monitoring is in place, onboard observers, land-based monitoring of the catches is in place, but enhanced scientific assessments of the impacts of the closures have not yet been done	(Y/N)	(Y/N)
Overall PI justification		-There is a 5-month closure of the industrial prawn fishery for stock recovery, but the inshore creek fisheries are not managed -General monitoring is in place, onboard observers, land-based monitoring of the catches is in place, but enhanced scientific assessments of the impacts of the closures have not yet been done		
References		Prawn Fishery management plan (PFMP), KMFRI Tech Reports; SDF statistics; Munga C. paper et. al		
			Likely PI Scoring Level (<60, 60-79, ≥ 80)	60-79

Evaluation Table for PI 1.2.1 – Harvest strategy

PI 1.2.1		There is a robust and precautionary harvest strategy in place		
Scoring Issue		SG 60	SG 80	SG 100
a	Harvest strategy design			
	Guidepost	The harvest strategy is expected to achieve stock management objectives reflected in PI 1.1.1 SG80.	The harvest strategy is responsive to the state of the stock and the elements of the harvest strategy work together towards achieving stock management objectives reflected in PI 1.1.1 SG80.	The harvest strategy is responsive to the state of the stock and is designed to achieve stock management objectives reflected in PI 1.1.1 SG80.
	Met?	No, no strategy for SSF prawn fisheries, need to expand the PFMP prawn management plan to cover the SSF fisheries for sustainability since both the SSF and Industrial fisheries comprise one stock.	(Y/N)	(Y/N)
b	Harvest strategy evaluation			
	Guidepost	The harvest strategy is likely to work based on prior experience or plausible argument.	The harvest strategy may not have been fully tested but evidence exists that it is achieving its objectives.	The performance of the harvest strategy has been fully evaluated and evidence exists to show that it is achieving its objectives including being clearly able to maintain stocks at target levels.
	Met?	No specific strategy for SSF, no evaluation	(Y/N)	(Y/N)
c	Harvest strategy monitoring			
	Guidepost	Monitoring is in place that is expected to determine whether the harvest strategy is working.		
	Met?	No specific strategy for SSF, no monitoring		
d	Harvest strategy review			
	Guidepost			The harvest strategy is periodically reviewed and improved as necessary.
	Met?			No specific strategy for SSF, no review
e	Shark finning			

PI 1.2.1		There is a robust and precautionary harvest strategy in place		
	Guidepost	It is likely that shark finning is not taking place.	It is highly likely that shark finning is not taking place.	There is a high degree of certainty that shark finning is not taking place.
	Met?	Not relevant	(Y/N/Not relevant)	(Y/N/Not relevant)
f	Review of alternative measures			
	Guidepost	There has been a review of the potential effectiveness and practicality of alternative measures to minimize UoA-related mortality of unwanted catch of the target stock.	There is a regular review of the potential effectiveness and practicality of alternative measures to minimize UoA-related mortality of unwanted catch of the target stock and they are implemented as appropriate.	There is a biennial review of the potential effectiveness and practicality of alternative measures to minimize UoA-related mortality of unwanted catch of the target stock, and they are implemented, as appropriate.
	Met?	Not relevant	(Y/N/Not relevant)	(Y/N/Not relevant)
Overall PI justification		-No strategy for SSF prawn fisheries, need to expand the PFMP prawn management plan to cover the SSF fisheries for sustainability since both the SSF and Industrial fisheries comprise one stock. -No specific strategy for SSF, no evaluation; no monitoring; no review		
References		-Prawn Fishery management plan (PFMP), KMFRI Tech Reports; SDF statistics; Munga C. paper et. al		
			Likely PI Scoring Level (<60, 60-79, ≥ 80)	<60

Evaluation Table for PI 1.2.2 – Harvest control rules and tools

PI 1.2.2		There are well defined and effective harvest control rules (HCRs) in place		
Scoring Issue		SG 60	SG 80	SG 100
a	HCRs design and application			
	Guide post	Generally understood HCRs are in place or available that is expected to reduce the exploitation rate as the point of recruitment impairment (PRI) is approached.	Well defined HCRs are in place that ensure that the exploitation rate is reduced as the PRI is approached, are expected to keep the stock fluctuating around a target level consistent with (or above) MSY, or for key LTL species a level consistent with ecosystem needs.	The HCRs are expected to keep the stock fluctuating at or above a target level consistent with MSY, or another more appropriate level taking into account the ecological role of the stock, most of the time.
	Met?	Yes, HCRs are in place for the Industrial fisheries, none specific to SSF prawns; SSF likely to benefit from	(Y/N)	

PI 1.2.2	There are well defined and effective harvest control rules (HCRs) in place		
	HCRs in industrial fishery given the continuity of the stocks		
b	HCRs robustness to uncertainty		
	Guidepost		The HCRs are likely to be robust to the main uncertainties. The HCRs take account of a wide range of uncertainties including the ecological role of the stock, and there is evidence that the HCRs are robust to the main uncertainties.
	Met?		Yes, for the Industrial scale fisheries; but little attention to the SSF prawns, clear demarcation of SEZ and compliance evident. (Y/N)
c	HCRs evaluation		
	Guidepost	There is some evidence that tools used or available to implement HCRs are appropriate and effective in controlling exploitation.	Available evidence indicates that the tools in use are appropriate and effective in achieving the exploitation levels required under the HCRs. Evidence clearly shows that the tools in use are effective in achieving the exploitation levels required under the HCRs.
	Met?	Yes, some evidence is available from analysis; however, analysis to link HCRs to exploitation levels achieved.	(Y/N) (Y/N)
Overall PI justification	-Prawn fishery management frameworks; linkage between management of the industrial fishery mgt and the SSF prawn fisheries; compliance based on VMS reporting, etc HCRs are in place for the Industrial fisheries, none specific to SSF prawns; SSF likely to benefit from HCRs in industrial fishery given the continuity of the stocks HCRs are robust for the Industrial scale fisheries; but little attention to the SSF prawns, clear demarcation of SEZ and compliance evident. Some evidence is available the tools used to implement HCRs are effective from analysis; however, analysis to link HCRs to exploitation levels achieved.		
References	PFMP, KMFRI Tech Reports; SDF compliance with VMS, etc.;		
Likely PI Scoring Level (<60, 60-79, ≥ 80)		60-79	

Evaluation Table for PI 1.2.3 – Information and monitoring

PI 1.2.3		Relevant information is collected to support the harvest strategy		
Scoring Issue		SG 60	SG 80	SG 100
a	Range of information			
	Guidepost	Some relevant information related to stock structure, stock productivity and fleet composition is available to support the harvest strategy.	Sufficient relevant information related to stock structure, stock productivity, fleet composition and other data is available to support the harvest strategy.	A comprehensive range of information (on stock structure, stock productivity, fleet composition, stock abundance, UoA removals and other information such as environmental information), including some that may not be directly related to the current harvest strategy, is available.
	Met?	Yes, some information available, but mainly focused on the Malindi-Ungwana Bay fisheries; need to expand to other inshore creeks; Lamu, Tudor, Port-Reitz, Majoreni, Vanga etc.	(Y/N)	(Y/N)
b	Monitoring			
	Guidepost	Stock abundance and UoA removals are monitored and at least one indicator is available and monitored with sufficient frequency to support the harvest control rule.	Stock abundance and UoA removals are regularly monitored at a level of accuracy and coverage consistent with the harvest control rule , and one or more indicators are available and monitored with sufficient frequency to support the harvest control rule.	All information required by the harvest control rule is monitored with high frequency and a high degree of certainty, and there is a good understanding of inherent uncertainties in the information [data] and the robustness of assessment and management to this uncertainty.
	Met?	Yes, stock monitoring within the land-based prawn fishery project is in place, though sporadic due to funding; lack of permanent ground staff etc.	(Y/N)	(Y/N)
c	Comprehensiveness of information			

PI 1.2.3		Relevant information is collected to support the harvest strategy	
	Guidepost		There is good information on all other fishery removals from the stock.
	Met?		Yes, a lot of data available incl. the industrial prawn as well as removals by other fisheries etc.
Overall PI justification		<p>-Some information available, but mainly focused on the Malindi-Ungwana Bay fisheries; need to expand to other inshore creeks; Lamu, Tudor, Port-Reitz, Majoreni, Vanga, Shimoni etc. etc.</p> <p>-Stock monitoring within the land-based prawn fishery project is in place, though sporadic due to funding; lack of permanent ground staff etc.</p> <p>-A lot of data available incl. the industrial prawn as well as removals by other fisheries etc.</p>	
References		PFMP, KMFRI Tech Reports; SDF compliance with VMS, etc.;	
Likely PI Scoring Level (<60, 60-79, ≥ 80)			60-79

Evaluation Table for PI 1.2.4 – Assessment of stock status

PI 1.2.4		There is an adequate assessment of the stock status		
Scoring Issue		SG 60	SG 80	SG 100
a	Appropriateness of assessment to stock under consideration			
	Guidepost		The assessment is appropriate for the stock and for the harvest control rule.	The assessment takes into account the major features relevant to the biology of the species and the nature of the UoA.
	Met?		Yes, ref. Prawn fishery Fact sheet for data incl. MSY, F_{MSY} , SSB, Exploitation rates,	(Y/N)
b	Assessment approach			
	Guidepost	The assessment estimates stock status relative to generic reference points appropriate to the species category.	The assessment estimates stock status relative to reference points that are appropriate to the stock and can be estimated.	
	Met?	(Y/N)	Yes, ref. Prawn fishery Fact sheet for data incl. MSY, F_{MSY} , SSB, Exploitation rates & other Ref. points	
c	Uncertainty in the assessment			
	Guidepost	The assessment identifies major sources of uncertainty.	The assessment takes uncertainty into account.	The assessment takes into account uncertainty and is evaluating stock status relative to reference

PI 1.2.4		There is an adequate assessment of the stock status		
				points in a probabilistic way.
	Met?	(Y/N)	Yes, uncertainty accounted for, but need to analyze the composite prawn fishery stock (SSF & industrial) with new Ref. points for the overall stocks, while using simulation modeling to account for any uncertainties	(Y/N)
d	Evaluation of assessment			
	Guidepost			The assessment has been tested and shown to be robust. Alternative hypotheses and assessment approaches have been rigorously explored.
	Met?			Yes, wide approaches employed including traditional Surplus models, Barefoot LBF stock assessment, SNAP etc
e	Peer review of assessment			
	Guidepost		The assessment of stock status is subject to peer review.	The assessment has been internally and externally peer reviewed.
	Met?		Yes, extensive internal reviews done need to subject analysis to external reviews.	(Y/N)
Overall PI justification		-Assessment of stocks conducted, ref. Prawn fishery Fact sheet for data incl. MSY, F_{MSY} , SSB, Exploitation rates & other Ref. points -Uncertainty accounted for, but need to analyze the composite prawn fishery stock (SSF & industrial) with new Ref. points for the overall stocks, while using simulation modelling to account for any uncertainties -Wide approaches employed including traditional Surplus models, Barefoot LBF stock assessment, SNAP etc.; Extensive internal reviews done, need to subject analysis to external reviews		
References				
			Likely PI Scoring Level (<60, 60-79, ≥ 80)	≥ 80

Principle 2 Maintenance of the fishery ecosystem

Evaluation Table for PI 2.1.1 – Primary species outcome

PI 2.1.1	The UoA aims to maintain primary species above the PRI and does not hinder recovery of primary species if they are below the PRI.			
Scoring Issue	SG 60	SG 80	SG 100	
a	Main primary species stock status			
	Guidepost	Main primary species are likely to be above the PRI OR If the species is below the PRI, the UoA has measures in place that are expected to ensure that the UoA does not hinder recovery and rebuilding.	Main primary species are highly likely to be above the PRI OR If the species is below the PRI, there is either evidence of recovery or a demonstrably effective strategy in place between all MSC UoAs which categorize this species as main , to ensure that they collectively do not hinder recovery and rebuilding.	There is a high degree of certainty that main primary species are above the PRI and are fluctuating around a level consistent with MSY.
	Met?	Yes, <i>Metapenaeus monoceros</i> (11.5%), of penaeid landings; indication of good stock standing.	(Y/N)	(Y/N)
b	Minor primary species stock status			
	Guidepost			Minor primary species are highly likely to be above the PRI OR If below the PRI, there is evidence that the UoA does not hinder the recovery and rebuilding of minor primary species
	Met?			Yes stocks ok: <i>M. stebbingi</i> (3.2%), <i>P. semisulcatus</i> (5.1%) of penaeid landings; indication of good stock standing.
Overall PI justification	Stocks are okay: <i>Metapenaeus monoceros</i> (11.5%), of penaeid landings; indication of good stock standing Stocks are okay: <i>M. stebbingi</i> (3.2%), <i>P. semisulcatus</i> (5.1%) of penaeid landings; indication of good stock standing.			
References	Prawn fishery Factsheet, PFMP, SDF stats; KMFRI Tech Reports;			
RBF Required? (✓/✗/)	X	Likely PI Scoring Level (<60, 60-79, ≥ 80)	60-79	

Evaluation Table for PI 2.1.2 – Primary species management strategy

PI 2.1.2	There is a strategy in place that is designed to maintain or to not hinder rebuilding of primary species, and the UoA regularly reviews and implements measures, as appropriate, to minimize the mortality of unwanted catch.		
Scoring Issue	SG 60	SG 80	SG 100
a	Management strategy in place		
Guidepost	There are measures in place for the UoA, if necessary, that are expected to maintain or to not hinder rebuilding of the main primary species at/to levels which are likely to above the point where recruitment would be impaired.	There is a partial strategy in place for the UoA, if necessary, that is expected to maintain or to not hinder rebuilding of the main primary species at/to levels which are highly likely to be above the point where recruitment would be impaired.	There is a strategy in place for the UoA for managing main and minor primary species.
Met?	Yes, there is mesh size regulations on cod-end, seine nets, ban on monofilament, beach seines etc.	(Y/N)	(Y/N)
b	Management strategy evaluation		
Guidepost	The measures are considered likely to work, based on plausible argument (e.g., general experience, theory or comparison with similar fisheries/species).	There is some objective basis for confidence that the measures/partial strategy will work, based on some information directly about the fishery and/or species involved.	Testing supports high confidence that the partial strategy/strategy will work, based on information directly about the fishery and/or species involved.
Met?	Yes, likely to work based on assessments under the previous KCDP project; gear development and trials, SSF data, fisher identification, monitoring under Land-based surveys etc.	(Y/N)	(Y/N)
c	Management strategy implementation		
Guidepost		There is some evidence that the measures/partial strategy is being implemented successfully .	There is clear evidence that the partial strategy/strategy is being implemented successfully and is achieving its overall objective as set out in scoring issue (a).

PI 2.1.2		There is a strategy in place that is designed to maintain or to not hinder rebuilding of primary species, and the UoA regularly reviews and implements measures, as appropriate, to minimize the mortality of unwanted catch.		
	Met?		Yes, results from trials on gears, restrictions on mesh, closed seasons within the wider prawn fishery have shown some evidence that the prawn fishery is working	(Y/N)
d	Shark finning			
	Guidepost	It is likely that shark finning is not taking place.	It is highly likely that shark finning is not taking place.	There is a high degree of certainty that shark finning is not taking place.
	Met?	Not relevant	(Y/N/Not relevant)	(Y/N/Not relevant)
e	Review of alternative measures			
	Guidepost	There is a review of the potential effectiveness and practicality of alternative measures to minimize UoA-related mortality of unwanted catch of main primary species.	There is a regular review of the potential effectiveness and practicality of alternative measures to minimize UoA-related mortality of unwanted catch of main primary species and they are implemented as appropriate.	There is a biennial review of the potential effectiveness and practicality of alternative measures to minimize UoA-related mortality of unwanted catch of all primary species, and they are implemented, as appropriate.
	Met?	Not relevant	(Y/N/Not relevant)	(Y/N/Not relevant)
Overall PI justification		<p>-Yes, there is mesh size regulations on cod-end, seine nets, ban on monofilament, beach seines etc.</p> <p>-Yes, likely to work based on assessments under the previous KCDP project; gear development and trials, SSF data, fisher identification, monitoring under Land-based surveys etc.</p> <p>-Yes, results from trials on gears, restrictions on mesh, closed seasons within the wider prawn fishery have shown some evidence that the prawn fishery is working</p> <p>-the PFMP should incorporate the SSF prawn fishery and update the plan to cover the composite fishery of both SSF and industrial fisheries</p>		
References		KCDP reports, FAO 1971		
			Likely PI Scoring Level (<60, 60-79, ≥ 80)	60-79

Evaluation Table for PI 2.1.3 – Primary species information

PI 2.1.3		Information on the nature and extent of primary species is adequate to determine the risk posed by the UoA and the effectiveness of the strategy to manage primary species		
Scoring Issue		SG 60	SG 80	SG 100
a	Information adequacy for assessment of impact on main primary species			
	Guidepost	Qualitative information is adequate to estimate	Some quantitative information is available and is adequate to assess	Quantitative information is available and is adequate to assess with a

PI 2.1.3		Information on the nature and extent of primary species is adequate to determine the risk posed by the UoA and the effectiveness of the strategy to manage primary species		
		the impact of the UoA on the main primary species with respect to status. OR If RBF is used to score PI 2.1.1 for the UoA: Qualitative information is adequate to estimate productivity and susceptibility attributes for main primary species.	the impact of the UoA on the main primary species with respect to status. OR If RBF is used to score PI 2.1.1 for the UoA: Some quantitative information is adequate to assess productivity and susceptibility attributes for main primary species.	high degree of certainty the impact of the UoA on main primary species with respect to status.
	Met?	(Y/N)	Yes, adequate data available, some initial analysis conducted with established ref. points; stock estimates fairly good.	(Y/N)
b		Information adequacy for assessment of impact on minor primary species		
	Guidepost			Some quantitative information is adequate to estimate the impact of the UoA on minor primary species with respect to status.
	Met?			Yes, data and information is adequate to assess impacts of the fishery on the minor species with respect to the status of fishery and stocks
c		Information adequacy for management strategy		
	Guidepost	Information is adequate to support measures to manage main primary species.	Information is adequate to support a partial strategy to manage main Primary species.	Information is adequate to support a strategy to manage all primary species, and evaluate with a high degree of certainty whether the strategy is achieving its objective.
	Met?	(Y/N)	Yes, fairly some extensive analysis conducted, Reference points established, but continuous monitoring	(Y/N)

PI 2.1.3	Information on the nature and extent of primary species is adequate to determine the risk posed by the UoA and the effectiveness of the strategy to manage primary species		
		needed to update the analysis and Ref. points	
Overall PI justification	<p>-Yes, adequate data available, some initial analysis conducted with established ref. points; stock estimates fairly good.</p> <p>-Yes, data and information is adequate to assess impacts of the fishery on the minor species with respect to the status of fishery and stocks</p> <p>-Yes, fairly some extensive analysis conducted, Reference points established, but continuous monitoring needed to update the analysis and Ref. points</p>		
References	Samoils and Kanyange 2008		
	Likely PI Scoring Level (<60, 60-79, ≥ 80)	≥ 80	

Evaluation Table for PI 2.2.1 – Secondary species outcome

PI 2.2.1	The UoA aims to maintain secondary species above a biologically based limit and does not hinder recovery of secondary species if they are below a biological based limit.		
Scoring Issue	SG 60	SG 80	SG 100
a	Main secondary species stock status		
Guidepost	<p>Main Secondary species are likely to be within biologically based limits.</p> <p>OR</p> <p>If below biologically based limits, there are measures in place expected to ensure that the UoA does not hinder recovery and rebuilding.</p>	<p>Main secondary species are highly likely to be above biologically based limits</p> <p>OR If below biologically based limits, there is either evidence of recovery or a demonstrably effective partial strategy in place such that the UoA does not hinder recovery and rebuilding.</p> <p>AND Where catches of a main secondary species outside of biological limits are considerable, there is either evidence of recovery/demonstrably effective strategy in place between those MSC UoAs that also have considerable catches of the species, to ensure that they collectively do not hinder recovery and rebuilding.</p>	<p>There is a high degree of certainty that main secondary species are within biologically based limits.</p>
Met?	Yes, data available, comprises <i>M. rude</i> at (11%); need for more	(Y/N)	(Y/N)

PI 2.2.1	The UoA aims to maintain secondary species above a biologically based limit and does not hinder recovery of secondary species if they are below a biological based limit.		
	surveys and analysis of trends		
b	Minor secondary species stock status		
	Guidepost		Minor secondary species are highly likely to be above biologically based limits. OR If below biologically based limits', there is evidence that the UoA does not hinder the recovery and rebuilding of secondary species
	Met?		No, limited data on some species e.g. Palaemon spp.
Overall PI justification	Data available, comprises <i>M. rude</i> at (11%); need for more surveys and analysis of trends Limited data on some species e.g. <i>Palaemon</i> spp., <i>P. letisulcatus</i> , <i>P. canaliculatus</i>		
References	Fulanda et al., 2011; frames surveys 2016; Munga et al., 2012		
RBF Required? (✓/✗/)	Not required	Likely PI Scoring Level (<60, 60-79, ≥ 80)	<60

Evaluation Table for PI 2.2.2 – Secondary species management strategy

PI 2.2.2	There is a strategy in place for managing secondary species that is designed to maintain or to not hinder rebuilding of secondary species and the UoA regularly reviews and implements measures, as appropriate, to minimize the mortality of unwanted catch.			
Scoring Issue	SG 60	SG 80	SG 100	
a	Management strategy in place			
	Guidepost	There are measures in place, if necessary, which are expected to maintain or not hinder rebuilding of main secondary species at/to levels which are highly likely to be within biologically based limits or to ensure that the UoA does not hinder their recovery.	There is a partial strategy in place, if necessary, for the UoA that is expected to maintain or not hinder rebuilding of main secondary species at/to levels which are highly likely to be within biologically based limits or to ensure that the UoA does not hinder their recovery.	There is a strategy in place for the UoA for managing main and minor secondary species.
	Met?	No measures in place	(Y/N)	(Y/N)
b	Management strategy evaluation			
	Guide post	The measures are considered likely to	There is some objective basis for confidence that	Testing supports high confidence that the partial

<p>PI 2.2.2</p>	<p>There is a strategy in place for managing secondary species that is designed to maintain or to not hinder rebuilding of secondary species and the UoA regularly reviews and implements measures, as appropriate, to minimize the mortality of unwanted catch.</p>		
	<p>work, based on plausible argument (e.g. general experience, theory or comparison with similar UoAs/species).</p>	<p>the measures/partial strategy will work, based on some information directly about the UoA and/or species involved.</p>	<p>strategy/strategy will work, based on information directly about the UoA and/or species involved.</p>
	<p>Met?</p>	<p>No measures in place, no evaluations in place</p>	<p>(Y/N) (Y/N)</p>
<p>c</p>	<p>Management strategy implementation</p>		
	<p>Guidepost</p>	<p>There is some evidence that the measures/partial strategy is being implemented successfully.</p>	<p>There is clear evidence that the partial strategy/strategy is being implemented successfully and is achieving its objective as set out in scoring issue (a).</p>
	<p>Met?</p>	<p>No measures in place, no ongoing implementation</p>	<p>(Y/N) (Y/N)</p>
<p>d</p>	<p>Shark finning</p>		
	<p>Guidepost</p>	<p>It is likely that shark finning is not taking place.</p>	<p>It is highly likely that shark finning is not taking place. There is a high degree of certainty that shark finning is not taking place.</p>
	<p>Met?</p>	<p>Not relevant</p>	<p>(Y/N/Not relevant) (Y/N/Not relevant)</p>
<p>e</p>	<p>Review of alternative measures to minimize mortality of unwanted catch</p>		
	<p>[Scoring issue need not be scored if are no unwanted catches of secondary species]</p>		
	<p>Guidepost</p>	<p>There is a regular review of the potential effectiveness and practicality of alternative measures to minimize UoA-related mortality of unwanted catch of main secondary species.</p>	<p>There is a biennial review of the potential effectiveness and practicality of alternative measures to minimize UoA-related mortality of unwanted catch of all secondary species, and they are implemented, as appropriate.</p>
	<p>Met?</p>	<p>Not relevant</p>	<p>(Y/N/Not relevant) (Y/N/Not relevant)</p>
<p>Overall PI justification</p>	<p>No measures in place; no evaluations; no ongoing implementation</p>		
<p>References</p>	<p>Fulanda et al.,2011; Munga et al., 2012</p>		
<p>Likely PI Scoring Level (<60, 60-79, ≥ 80)</p>	<p><60</p>		

Evaluation Table for PI 2.2.3 – Secondary species information

PI 2.2.3	Information on the nature and amount of secondary species taken is adequate to determine the risk posed by the UoA and the effectiveness of the strategy to manage secondary species.		
Scoring Issue	SG 60	SG 80	SG 100
a	Information adequacy for assessment of impacts on main secondary species		
Guidepost	Qualitative information is adequate to estimate the impact of the UoA on the main secondary species with respect to status. OR If RBF is used to score PI 2.2.1 for the UoA: Qualitative information is adequate to estimate productivity & susceptibility attributes for main secondary species.	Some quantitative information is available and adequate to assess the impact of the UoA on main secondary species with respect to status. OR If RBF is used to score PI 2.2.1 for the UoA: Some quantitative information is adequate to assess productivity and susceptibility attributes for main secondary species.	Quantitative information is available and adequate to assess with a high degree of certainty the impact of the UoA on main secondary species with respect to status.
Met?	Yes, some information is available to determine the impacts of prawn fishery on the secondary species; e.g. composition data and trends	(Y/N)	(Y/N)
b	Information adequacy for assessment of impacts on minor secondary species		
Guidepost			Some quantitative information is adequate to estimate the impact of the UoA on minor secondary species with respect to status.
Met?			No information on minor species, data is scanty
c	Information adequacy for management strategy		
Guidepost	Information is adequate to support measures to manage main secondary species.	Information is adequate to support a partial strategy to manage main secondary species.	Information is adequate to support a strategy to manage all secondary species, and evaluate with a high degree of certainty whether the strategy is achieving its objective .

PI 2.2.3		Information on the nature and amount of secondary species taken is adequate to determine the risk posed by the UoA and the effectiveness of the strategy to manage secondary species.	
Met?	No information on minor species, little data is scanty	(Y/N)	(Y/N)
Overall PI justification	- Yes, some information is available to determine the impacts of prawn fishery on the secondary species; e.g. composition data and trends -No information on minor species, data is scanty		
References	KMFRI tech reports; Prawn fishery Fact sheets		
		Likely PI Scoring Level (<60, 60-79, ≥ 80)	<60

Evaluation Table for PI 2.3.1 – ETP species outcome

PI 2.3.1		The UoA meets national and international requirements for the protection of ETP species. The UoA does not hinder recovery of ETP species		
Scoring Issue	SG 60	SG 80	SG 100	
a	Effects of the UoA on population/stock within national or international limits, where applicable [Scoring issue need not be scored if there are no national or international requirements that set limits for ETP species].			
Guidepost	Where national and/or international requirements set limits for ETP species, the effects of the UoA on the population/stock are known and likely to be within these limits.	Where national and/or international requirements set limits for ETP species, the combined effects of the MSC UoAs on the population/stock are known and highly likely to be within these limits.	Where national and/or international requirements set limits for ETP species, there is a high degree of certainty that the combined effects of the MSC UoAs are within these limits.	
Met?	Not relevant	(Y/N/Not relevant)	(Y/N/Not relevant)	
b	Direct effects			
Guidepost	Known direct effects of the UoA are likely to not hinder recovery of ETP species.	Known direct effects of the UoA are highly likely to not hinder recovery of ETP species.	There is a high degree of confidence that there are no significant detrimental direct effects of the UoA on ETP species.	
Met?	Yes, but data on likely impacts on e.g. nesting sites for sea turtles is scanty; by-catch of juvenile sharks, some extensive studies are required to decipher the possible impacts	(Y/N)	(Y/N)	
c	Indirect effects			
Guide post		Indirect effects have been considered and are thought to be highly likely	There is a high degree of confidence that there are no significant detrimental	

PI 2.3.1	The UoA meets national and international requirements for the protection of ETP species. The UoA does not hinder recovery of ETP species		
		to not create unacceptable impacts.	indirect effects of the fishery on ETP species.
	Met?	Yes, no known indirect impacts on ETPs, data is scanty; further surveys would re-evaluate likely impacts on ETPs esp. sea turtles, sharks etc.	(Y/N)
Overall PI justification	National and/or international requirements set limits for ETP species specific to the SSF prawn fishery, Data on likely impacts on e.g. nesting sites for sea turtles is scanty; by-catch of juvenile sharks, some extensive studies are required to decipher the possible impacts, No known indirect impacts on ETPs, data is scanty; further surveys would re-evaluate likely impacts on ETPs esp. sea turtles, sharks etc.		
References	Kiilu thesis; Remmy Oddenyo; Kaunda arara; KMFRI Tech reports; Fact sheets etc		
RBF Required? (✓/✗/)	Not required	Likely PI Scoring Level (<60, 60-79, ≥ 80)	60-79

Evaluation Table for PI 2.3.2 – ETP species management strategy

PI 2.3.2	The UoA has in place precautionary management strategies designed to: <ul style="list-style-type: none"> • meet national and international requirements; • ensure the UoA does not hinder recovery of ETP species. Also, the UoA regularly reviews and implements measures, as appropriate, to minimize the mortality of ETP species.		
Scoring Issue	SG 60	SG 80	SG 100
a	Management strategy in place (national and international requirements); [Scoring issue need not be scored if there are no requirements for protection or rebuilding provided through national ETP legislation or international agreements].		
	Guidepost	There are measures in place that minimize the UoA-related mortality of ETP species, and are expected to be highly likely to achieve national and international requirements for the protection of ETP species.	There is a strategy in place for managing the UoA's impact on ETP species, including measures to minimize mortality, which is designed to be highly likely to achieve national and international requirements for the protection of ETP species.
	Met?	Yes, with restrictions on mesh sizes, introduction of gear modifications, protection of nesting sites by BMUs etc.,	(Y/N/Not relevant)
			(Y/N/Not relevant)

<p>PI 2.3.2</p>	<p>The UoA has in place precautionary management strategies designed to:</p> <ul style="list-style-type: none"> • meet national and international requirements; • ensure the UoA does not hinder recovery of ETP species. <p>Also, the UoA regularly reviews and implements measures, as appropriate, to minimize the mortality of ETP species.</p>		
	<p>existing legislations, wildlife Act, co-mgt plan for Malindi Ungwana Bay; etc.</p>		
<p>b</p>	<p>Management strategy in place (alternative) [Scoring issue need not be scored if there are requirements for protection or rebuilding provided through national ETP legislation or international agreements].</p>		
<p>Guidepost</p>	<p>There are measures in place that are expected to ensure the UoA does not hinder the recovery of ETP species.</p>	<p>There is a strategy in place that is expected to ensure the UoA does not hinder the recovery of ETP species.</p>	<p>There is a comprehensive strategy in place for managing ETP species, to ensure the UoA does not hinder the recovery of ETP species</p>
<p>Met?</p>	<p>Not relevant</p>	<p>(Y/N/Not relevant)</p>	<p>(Y/N/Not relevant)</p>
<p>c</p>	<p>Management strategy evaluation</p>		
<p>Guidepost</p>	<p>The measures are considered likely to work, based on plausible argument (e.g. general experience, theory or comparison with similar fisheries/species).</p>	<p>There is an objective basis for confidence that the measures/strategy will work, based on information directly about the fishery and/or the species involved.</p>	<p>The strategy/comprehensive strategy is mainly based on information directly about the fishery and/or species involved, and a quantitative analysis supports high confidence that the strategy will work.</p>
<p>Met?</p>	<p>Yes, existing measures based on BMU regulations and existing legislation have been tested and are periodically reviewed</p>	<p>(Y/N)</p>	<p>(Y/N)</p>
<p>d</p>	<p>Management strategy implementation</p>		
<p>Guidepost</p>		<p>There is some evidence that the measures/strategy is being implemented successfully.</p>	<p>There is clear evidence that the strategy/comprehensive strategy is being implemented successfully and is achieving its objective as set out in scoring issue (a) or (b).</p>
<p>Met?</p>		<p>Yes, BMU MCS surveillance structures in place, PFMP</p>	<p>(Y/N)</p>

PI 2.3.2	<p>The UoA has in place precautionary management strategies designed to:</p> <ul style="list-style-type: none"> • meet national and international requirements; • ensure the UoA does not hinder recovery of ETP species. <p>Also, the UoA regularly reviews and implements measures, as appropriate, to minimize the mortality of ETP species.</p>			
			implementation ongoing etc.	
e	Review of alternative measures to minimize mortality of ETP species			
	Guidepost	There is a review of the potential effectiveness and practicality of alternative measures to minimize UoA-related mortality of ETP species.	There is a regular review of the potential effectiveness and practicality of alternative measures to minimize UoA-related mortality of ETP species and they are implemented as appropriate.	There is a biennial review of the potential effectiveness and practicality of alternative measures to minimize UoA-related mortality ETP species, and they are implemented, as appropriate.
	Met?	Yes, periodic review of fishery impacts, push for gear improvements to reduced by-catch and potential impacts on ETPs	(Y/N)	(Y/N)
Overall PI justification	<p>There are restrictions on mesh sizes, introduction of gear modifications, protection of nesting sites by BMUs etc., existing legislations, wildlife Act, co-mgt plan for Malindi Ungwana Bay; etc.</p> <p>Existing measures based on BMU regulations and existing legislation have been tested and are periodically reviewed</p> <p>BMU MCS surveillance structures in place, PFMP implementation ongoing etc.</p> <p>Periodic review of fishery impacts, push for gear improvements to reduced by-catch and potential impacts on ETPs</p>			
References	Fulanda et al., 2011 and Munga et al.,2012			
			Likely PI Scoring Level (<60, 60-79, ≥ 80)	60-79

Evaluation Table for PI 2.3.3 – ETP species information

PI 2.3.3	<p>Relevant information is collected to support the management of UoA impacts on ETP species, including:</p> <ul style="list-style-type: none"> • Information for the development of the management strategy; • Information to assess the effectiveness of the management strategy; and • Information to determine the outcome status of ETP species. 			
Scoring Issue	SG 60	SG 80	SG 100	
a	Information adequacy for assessment of impacts			
	Guidepost	Qualitative information is adequate to estimate the UoA related mortality on ETP species.	Some quantitative information is adequate to assess the UoA related mortality and impact and to determine whether the UoA may be a threat to	Quantitative information is available to assess with a high degree of certainty the magnitude of UoA-related impacts, mortalities and injuries

PI 2.3.3	<p>Relevant information is collected to support the management of UoA impacts on ETP species, including:</p> <ul style="list-style-type: none"> • Information for the development of the management strategy; • Information to assess the effectiveness of the management strategy; and • Information to determine the outcome status of ETP species. 		
	OR If RBF is used to score PI 2.3.1 for the UoA: Qualitative information is adequate to estimate productivity & susceptibility attributes for ETP species.	protection and recovery of the ETP species. OR If RBF is used to score PI 2.3.1 for the UoA: Some quantitative information is adequate to assess productivity and susceptibility attributes for ETP species.	and the consequences for the status of ETP species.
Met?	Yes: mode of gear operations and the fished grounds, data and information available can be used to qualitatively infer on possible impacts on ETPs	(Y/N)	(Y/N)
b	Information adequacy for management strategy		
Guidepost	Information is adequate to support measures to manage the impacts on ETP species.	Information is adequate to measure trends and support a strategy to manage impacts on ETP species.	Information is adequate to support a comprehensive strategy to manage impacts, minimize mortality and injury of ETP species, and evaluate with a high degree of certainty whether a strategy is achieving its objectives.
Met?	(Y/N)	Yes: periodic monitoring on land-based, observer programmes on shallow water prawn fishery provides fair data and information to measure trends and guide definition of a management strategy for any impacts on ETPs	(Y/N)
Overall PI justification	<p>Mode of gear operations and the fished grounds, data and information available can be used to qualitatively infer on possible impacts on ETPs</p> <p>Periodic monitoring on land-based, observer programmes on shallow water prawn fishery provides fair data and information to measure trends and guide definition of a management strategy for any impacts on ETPs</p>		
References	Fulanda et al., 2011; Munga et al., 2012 and Frame surveys 2016		

PI 2.3.3	Relevant information is collected to support the management of UoA impacts on ETP species, including: <ul style="list-style-type: none"> • Information for the development of the management strategy; • Information to assess the effectiveness of the management strategy; and • Information to determine the outcome status of ETP species. 	Likely PI Scoring Level (<60, 60-79, ≥ 80)	60-79
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Evaluation Table for PI 2.4.1 – Habitats outcome

PI 2.4.1	The UoA does not cause serious or irreversible harm to habitat structure and function, considered on the basis of the area covered by the governance body(s) responsible for fisheries management in the area(s) where the UoA operates.		
Scoring Issue	SG 60	SG 80	SG 100
a	Commonly encountered habitat status		
Guidepost	The UoA is unlikely to reduce structure and function of the commonly encountered habitats to a point where there would be serious or irreversible harm.	The UoA is highly unlikely to reduce structure and function of the commonly encountered habitats to a point where there would be serious or irreversible harm.	There is evidence that the UoA is highly unlikely to reduce structure and function of the commonly encountered habitats to a point where there would be serious or irreversible harm.
Met?	Yes, low impacts but use of seine nets on coasts and seagrass beds, small meshed mosquito nets etc. can have detrimental impacts on ecosystems and habitats	(Y/N)	(Y/N)
b	VME habitat status [Scoring issue need not be scored if there are no VMEs].		
Guidepost	The UoA is unlikely to reduce structure and function of the VME habitats to a point where there would be serious or irreversible harm.	The UoA is highly unlikely to reduce structure and function of the VME habitats to a point where there would be serious or irreversible harm.	There is evidence that the UoA is highly unlikely to reduce structure and function of the VME habitats to a point where there would be serious or irreversible harm.
Met?	Yes, low impacts; use of seine nets on coasts and seagrass beds etc. can have detrimental impacts on ecosystems and habitats; but the populations of the fishers are fairly low	(Y/N/Not relevant)	(Y/N/Not relevant)

PI 2.4.1	The UoA does not cause serious or irreversible harm to habitat structure and function, considered on the basis of the area covered by the governance body(s) responsible for fisheries management in the area(s) where the UoA operates.		
	for any serious impacts on VMEs		
c	Minor habitat status		
	Guidepost		There is evidence that the UoA is highly unlikely to reduce structure and function of the minor habitats to a point where there would be serious or irreversible harm.
	Met?		No evidence
Overall PI justification	<p>Low impacts evident but use of seine nets on coasts and sea grass beds, small meshed mosquito nets etc. can have detrimental impacts on ecosystems and habitats</p> <p>Low impacts; use of seine nets on coasts and sea grass beds etc. can have detrimental impacts on ecosystems and habitats; but the populations of the fishers are fairly low for any serious impacts on VMEs</p> <p>-No evidence of reducing structure and function of minor habitats</p>		
References	Munga et al., 2012 and Fulanda et al., 2011		
RBF Required? (✓/✗/)	Not required	Likely PI Scoring Level (<60, 60-79, ≥ 80)	<60

Evaluation Table for PI 2.4.2 – Habitats management strategy

PI 2.4.2	There is a strategy in place that is designed to ensure the UoA does not pose a risk of serious or irreversible harm to the habitats.			
Scoring Issue	SG 60	SG 80	SG 100	
a	Management strategy in place			
	Guidepost	There are measures in place, if necessary, that are expected to achieve the Habitat Outcome 80 level of performance.	There is a partial strategy in place, if necessary, that is expected to achieve the Habitat Outcome 80 level of performance or above.	There is a strategy in place for managing the impact of all MSC UoAs/non-MSC fisheries on habitats.
	Met?	Yes, the Malindi-Ungwana bay co-management plan, The coral reef and seagrass strategy, Malindi-Sabaki Management plan, Tana delta Landuse plan, Mangrove management plan	(Y/N)	(Y/N)
b	Management strategy evaluation			
	Guidepost	The measures are considered likely to	There is some objective basis for confidence that	Testing supports high confidence that the partial

PI 2.4.2	There is a strategy in place that is designed to ensure the UoA does not pose a risk of serious or irreversible harm to the habitats.			
		work, based on plausible argument (e.g. general experience, theory or comparison with similar UoAs/habitats).	the measures/partial strategy will work, based on information directly about the UoA and/or habitats involved.	strategy/strategy will work, based on information directly about the UoA and/or habitats involved.
	Met?	Some management plans have been developed and some not implemented so considered likely to work e.g. Mangrove management plan	(Y/N)	(Y/N)
c	Management strategy implementation			
	Guidepost		There is some quantitative evidence that the measures/partial strategy is being implemented successfully.	There is clear quantitative evidence that the partial strategy/strategy is being implemented successfully and is achieving its objective, as outlined in scoring issue (a).
	Met?		No data available though few surveys conducted but not shared with the fishers and managers	(Y/N)
d	Compliance with management requirements and other MSC UoAs'/non-MSC fisheries' measures to protect VMEs [Scoring issue need not be scored if there are no VMEs].			
	Guidepost	There is qualitative evidence that the UoA complies with its management requirements to protect VMEs.	There is some quantitative evidence that the UoA complies with both its management requirements and with protection measures afforded to VMEs by other MSC UoAs/non-MSC fisheries, where relevant.	There is clear quantitative evidence that the UoA complies with both its management requirements and with protection measures afforded to VMEs by other MSC UoAs/non-MSC fisheries, where relevant.
	Met?	No, the PMFP manages the ecosystem but for the commercial fisheries not the artisanal	(Y/N/Not relevant)	(Y/N/Not relevant)
Overall PI justification	The Malindi-Ungwana bay co-management plan, The coral reef and sea grass strategy, Malindi-Sabaki Management plan, Tana delta Land use plan, Mangrove management plan Some management plans have been developed and some not implemented so considered likely to work e.g. Mangrove management plan -No data available though few surveys conducted but not shared with the fishers and managers			

PI 2.4.2	There is a strategy in place that is designed to ensure the UoA does not pose a risk of serious or irreversible harm to the habitats.
	The PMFP manages the ecosystem but for the commercial fisheries not the artisanal
References	Prawn Management Framework
	Likely PI Scoring Level (<60, 60-79, ≥ 80)
	<60

Evaluation Table for PI 2.4.3 – Habitats information

PI 2.4.3	Information is adequate to determine the risk posed to the habitat by the UoA and the effectiveness of the strategy to manage impacts on the habitat.			
Scoring Issue	SG 60	SG 80	SG 100	
a	Information quality			
	Guidepost	<p>The types and distribution of the main habitats are broadly understood.</p> <p>OR</p> <p>If CSA is used to score PI 2.4.1 for the UoA:</p> <p>Qualitative information is adequate to estimate the types and distribution of the main habitats.</p>	<p>The nature, distribution and vulnerability of the main habitats in the UoA area are known at a level of detail relevant to the scale and intensity of the UoA.</p> <p>OR</p> <p>If CSA is used to score PI 2.4.1 for the UoA:</p> <p>Some quantitative information is available and is adequate to estimate the types and distribution of the main habitats.</p>	<p>The distribution of all habitats is known over their range, with particular attention to the occurrence of vulnerable habitats.</p>
	Met?	No, limited information available in previous surveys eg the KENSEA project, National mangrove Management plan and KCDP project	(Y/N)	(Y/N)
b	Information adequacy for assessment of impacts			
	Guidepost	Information is adequate to broadly understand the nature of the main impacts of gear use on the main habitats, including spatial overlap of	Information is adequate to allow for identification of the main impacts of the UoA on the main habitats, and there is reliable information on the spatial extent of interaction and	The physical impacts of the gear on all habitats have been quantified fully.

PI 2.4.3		Information is adequate to determine the risk posed to the habitat by the UoA and the effectiveness of the strategy to manage impacts on the habitat.		
		habitat with fishing gear. OR If CSA is used to score PI 2.4.1 for the UoA: Qualitative information is adequate to estimate the consequence and spatial attributes of the main habitats.	on the timing and location of use of the fishing gear. OR If CSA is used to score PI 2.4.1 for the UoA: Some quantitative information is available and is adequate to estimate the consequence and spatial attributes of the main habitats.	
	Met?	No, since the datasets are old and outdated	(Y/N)	(Y/N)
c	Monitoring			
	Guidepost		Adequate information continues to be collected to detect any increase in risk to the main habitats.	Changes in habitat distributions over time are measured.
	Met?		(Y/N)	(Y/N)
Overall PI justification		There is limited information available in previous surveys eg the KENSEA project, National mangrove Management plan and KCDP project The datasets are old and outdated		
References		KENSEA project report, Mueni 2006, Mwatha 2001		
			Likely PI Scoring Level (<60, 60-79, ≥ 80)	<60

Evaluation Table for PI 2.5.1 – Ecosystem outcome

PI 2.5.1		The UoA does not cause serious or irreversible harm to the key elements of ecosystem structure and function.		
Scoring Issue		SG 60	SG 80	SG 100
a	Ecosystem status			
	Guidepost	The UoA is unlikely to disrupt the key elements underlying ecosystem structure and function to a point where there would be a serious or irreversible harm.	The UoA is highly unlikely to disrupt the key elements underlying ecosystem structure and function to a point where there would be a serious or irreversible harm.	There is evidence that the UoA is highly unlikely to disrupt the key elements underlying ecosystem structure and function to a point where there would be a serious or irreversible harm.
	Met?	(Y/N/Partial)	Partial, the fishery does not have impacts on the operation of the gears but the habitats such as sea	(Y/N/Partial)

PI 2.5.1	The UoA does not cause serious or irreversible harm to the key elements of ecosystem structure and function.		
		grass beds especially when the number of fishers is high. The trawlers operating in the same localities would impact on the habitat	
Overall PI justification	The fishery does not have impacts on the operation of the gears but the habitats such as sea grass beds especially when the number of fishers is high. The trawlers operating in the same localities would impact on the habitat		
References	Mwatha 2001; Munga et al., 2012		
RBF Required? (✓/✗/)	Not required	Likely PI Scoring Level (<60, 60-79, ≥ 80)	60-79

Evaluation Table for PI 2.5.2 – Ecosystem management strategy

PI 2.5.2	There are measures in place to ensure the UoA does not pose a risk of serious or irreversible harm to ecosystem structure and function.		
Scoring Issue	SG 60	SG 80	SG 100
a	Management strategy in place		
Guidepost	There are measures in place, if necessary which take into account the potential impacts of the fishery on key elements of the ecosystem.	There is a partial strategy in place, if necessary, which takes into account available information and is expected to restrain impacts of the UoA on the ecosystem so as to achieve the Ecosystem Outcome 80 level of performance.	There is a strategy that consists of a plan , in place which contains measures to address all main impacts of the UoA on the ecosystem, and at least some of these measures are in place.
Met?	No measures in place	(Y/N)	(Y/N)
b	Management strategy evaluation		
Guidepost	The measures are considered likely to work, based on plausible argument (e.g., general experience, theory or comparison with similar fisheries/ ecosystems).	There is some objective basis for confidence that the measures/partial strategy will work, based on some information directly about the UoA and/or the ecosystem involved	Testing supports high confidence that the partial strategy/strategy will work, based on information directly about the UoA and/or ecosystem involved
Met?	No evaluation	(Y/N)	(Y/N)
c	Management strategy implementation		
Guidepost		There is some evidence that the measures/partial strategy is being implemented successfully .	There is clear evidence that the partial strategy/strategy is being implemented successfully and is achieving its objective as set out in scoring issue (a) .

PI 2.5.2	There are measures in place to ensure the UoA does not pose a risk of serious or irreversible harm to ecosystem structure and function.		
Met?		No implementation	(Y/N)
Overall PI justification	No management measures put to ensure the UoA does not pose severe impacts to ecosystem structures and functions; no evaluations nor implementation		
References	Munga et al., 2012		
		Likely PI Scoring Level (<60, 60-79, ≥ 80)	<60

Evaluation Table for PI 2.5.3 – Ecosystem information

PI 2.5.3	There is adequate knowledge of the impacts of the UoA on the ecosystem.		
Scoring Issue	SG 60	SG 80	SG 100
a	Information quality		
Guidepost	Information is adequate to identify the key elements of the ecosystem.	Information is adequate to broadly understand the key elements of the ecosystem.	
Met?		Yes, there is limited information	
b	Investigation of UoA impacts		
Guidepost	Main impacts of the UoA on these key ecosystem elements can be inferred from existing information, but have not been investigated in detail.	Main impacts of the UoA on these key ecosystem elements can be inferred from existing information, and some have been investigated in detail .	Main interactions between the UoA and these ecosystem elements can be inferred from existing information, and have been investigated in detail .
Met?	Yes, impacts can be inferred from modeling work	(Y/N)	(Y/N)
c	Understanding of component functions		
Guidepost		The main functions of the components (i.e., P1 target species, primary, secondary and ETP species and Habitats) in the ecosystem are known .	The impacts of the UoA on P1 target species, primary, secondary and ETP species and Habitats are identified and the main functions of these components in the ecosystem are understood .
Met?		(Y/N)	Yes, research studies have been conducted e.g. Munga, Mueni, Fulanda, Mwatha, Kimani, Kaka
d	Information relevance		
Guidepost		Adequate information is available on the impacts of the UoA on these components to allow some of the main	Adequate information is available on the impacts of the UoA on the components and elements to allow the main

PI 2.5.3	There is adequate knowledge of the impacts of the UoA on the ecosystem.		
		consequences for the ecosystem to be inferred.	consequences for the ecosystem to be inferred.
	Met?	(Y/N)	Yes, research studies have been conducted e.g. Munga, Mueni, Fulanda, Mwatha, Kimani, Kaka
e	Monitoring		
	Guidepost	Adequate data continue to be collected to detect any increase in risk level.	Information is adequate to support the development of strategies to manage ecosystem impacts.
	Met?	(Y/N)	Yes, the research done may provide the data to develop strategies to manage this ecosystems
Overall PI justification	There is limited information to understand key ecosystem elements Impacts can be inferred from modelling work Research studies have been conducted e.g. Munga, Mueni, Fulanda, Mwatha, Kimani, Kaka		
References	Munga 2012, Mueni 2006, Fulanda 2011, Mwatha 2001,		
		Likely PI Scoring Level (<60, 60-79, ≥ 80)	≥ 80

Principle 3 Effective and responsible management

Evaluation Table for PI 3.1.1 – Legal and/or customary framework

PI 3.1.1	The management system exists within an appropriate legal and/or customary framework which ensures that it: <ul style="list-style-type: none"> Is capable of delivering sustainability in the UoA(s); and Observes the legal rights created explicitly or established by custom of people dependent on fishing for food or livelihood; and Incorporates an appropriate dispute resolution framework. 			
Scoring Issue	SG 60	SG 80	SG 100	
a	Compatibility of laws or standards with effective management			
	Guidepost	There is an effective national legal system and a framework for cooperation with other parties, where necessary, to deliver management outcomes consistent with MSC Principles 1 and 2	There is an effective national legal system and organized and effective cooperation with other parties, where necessary, to deliver management outcomes consistent with MSC Principles 1 and 2.	There is an effective national legal system and binding procedures governing cooperation with other parties which delivers management outcomes consistent with MSC Principles 1 and 2.
	Met?	(Y/N)	Yes such as the PFMP, BMU regulations, Fisheries Act, Devolution Act, Mangrove management Plan, ICZM policy	(Y/N)
b	Resolution of disputes			

PI 3.1.1	<p>The management system exists within an appropriate legal and/or customary framework which ensures that it:</p> <ul style="list-style-type: none"> • Is capable of delivering sustainability in the UoA(s); and • Observes the legal rights created explicitly or established by custom of people dependent on fishing for food or livelihood; and • Incorporates an appropriate dispute resolution framework. 		
Guidepost	The management system incorporates or is subject by law to a mechanism for the resolution of legal disputes arising within the system.	The management system incorporates or is subject by law to a transparent mechanism for the resolution of legal disputes which is considered to be effective in dealing with most issues and that is appropriate to the context of the UoA.	The management system incorporates or is subject by law to a transparent mechanism for the resolution of legal disputes that is appropriate to the context of the fishery and has been tested and proven to be effective .
Met?	Yes Fisheries Management and Development Act, BMU regulations, BMU networks, ICZM policy, co-management initiatives e.g. CCA's	(Y/N)	(Y/N)
c	Respect for rights		
Guidepost	The management system has a mechanism to generally respect the legal rights created explicitly or established by custom of people dependent on fishing for food or livelihood in a manner consistent with the objectives of MSC Principles 1 and 2.	The management system has a mechanism to observe the legal rights created explicitly or established by custom of people dependent on fishing for food or livelihood in a manner consistent with the objectives of MSC Principles 1 and 2.	The management system has a mechanism to formally commit to the legal rights created explicitly or established by custom of people dependent on fishing for food and livelihood in a manner consistent with the objectives of MSC Principles 1 and 2.
Met?	(Y/N)	Yes through Fisheries Management and Development Act, BMU regulations, BMU networks, ICZM policy, co-management initiatives e.g CCA's	(Y/N)
Overall PI justification	Frameworks including the PFMP, BMU regulations, Fisheries Act, Devolution Act, Mangrove management Plan, ICZM policy Fisheries Management and Development Act, BMU regulations, BMU networks, ICZM policy, co-management initiatives e.g. CCA's are also available		
References	Fisheries Management and Development Act, 2016; BMU regulations 2007; ICZM policy		

Likely PI Scoring Level
(<60, 60-79, ≥ 80)

60-79

Evaluation Table for PI 3.1.2 – Consultation, roles and responsibilities

PI 3.1.2	The management system has effective consultation processes that are open to interested and affected parties. The roles and responsibilities of Organizations and individuals who are involved in the management process are clear and understood by all relevant parties		
Scoring Issue	SG 60	SG 80	SG 100
a	Roles and responsibilities		
Guidepost	Organizations and individuals involved in the management process have been identified. Functions, roles and responsibilities are generally understood.	Organizations and individuals involved in the management process have been identified. Functions, roles and responsibilities are explicitly defined and well understood for key areas of responsibility and interaction.	Organizations and individuals involved in the management process have been identified. Functions, roles and responsibilities are explicitly defined and well understood for all areas of responsibility and interaction.
Met?	(Y/N)	Generally explicitly defined & well understood for key areas of responsibility & interaction but overlaps exist in the legal framework e.g. Wildlife Act for ETPs, EMCA for environmental issues etc.	(Y/N)
b	Consultation processes		
Guidepost	The management system includes consultation processes that obtain relevant information from the main affected parties, including local knowledge, to inform the management system.	The management system includes consultation processes that regularly seek and accept relevant information, including local knowledge. The management system demonstrates consideration of the information obtained.	The management system includes consultation processes that regularly seek and accept relevant information, including local knowledge. The management system demonstrates consideration of the information and explains how it is used or not used.
Met?		Yes	(Y/N)
c	Participation		
Guidepost		The consultation process provides opportunity for all interested and affected parties to be involved.	The consultation process provides opportunity and encouragement for all interested and affected parties to be involved, and facilitates their effective engagement.
Met?		(Y/N)	Yes

<p>PI 3.1.2</p>	<p>The management system has effective consultation processes that are open to interested and affected parties. The roles and responsibilities of Organizations and individuals who are involved in the management process are clear and understood by all relevant parties</p>		
<p>Overall PI justification</p>	<p>-Generally explicitly defined & well understood for key areas of responsibility & interaction but overlaps exist in the legal framework e.g. Wildlife Act for ETPs, EMCA for environmental issues etc. -Consultation processes are in place but not regular based on time frames, to inform management system -Consultations are encouraged, opportunities provided, and facilitation for BMUs, Stakeholders etc. given wherever opportunity arises</p>		
<p>References</p>	<p>[List any references here]</p>		
<table border="1"> <tr> <td data-bbox="740 685 1078 752"> <p>Likely PI Scoring Level (<60, 60-79, ≥ 80)</p> </td> <td data-bbox="1078 685 1410 752" style="background-color: #008000; color: white; text-align: center;"> <p>≥ 80</p> </td> </tr> </table>		<p>Likely PI Scoring Level (<60, 60-79, ≥ 80)</p>	<p>≥ 80</p>
<p>Likely PI Scoring Level (<60, 60-79, ≥ 80)</p>	<p>≥ 80</p>		

Evaluation Table for PI 3.1.3 – Long term objectives

<p>PI 3.1.3</p>	<p>The management policy has clear long-term objectives to guide decision-making that are consistent with MSC fisheries standard, and incorporates the precautionary approach.</p>		
<p>Scoring Issue</p>	<p>SG 60</p>	<p>SG 80</p>	<p>SG 100</p>
<p>a</p>	<p>Objectives</p>		
<p>Guidepost</p>	<p>Long-term objectives to guide decision-making, consistent with the MSC fisheries standard and the precautionary approach, are implicit within management policy.</p>	<p>Clear long-term objectives that guide decision-making, consistent with MSC fisheries standard and the precautionary approach are explicit within management policy.</p>	<p>Clear long-term objectives that guide decision-making, consistent with MSC fisheries standard and the precautionary approach, are explicit within and required by management policy.</p>
<p>Met?</p>	<p>(Y/N/Partial)</p>	<p>(Y/N/Partial)</p>	<p>Fisheries Act: calls for EAF approach to management at no less standards than defined in international agreements; IOTC, UNCLOS, IPOAs etc.</p>
<p>Overall PI justification</p>	<p>Fisheries Act: calls for EAF approach to management at no less standards than defined in international agreements; IOTC, UNCLOS, IPOAs etc.</p>		
<p>References</p>	<p>IOTC, UNCLOS 1982, Fisheries Development and Management act 2016</p>		
<table border="1"> <tr> <td data-bbox="740 1760 1078 1821"> <p>Likely PI Scoring Level (<60, 60-79, ≥ 80)</p> </td> <td data-bbox="1078 1760 1410 1821" style="background-color: #008000; color: white; text-align: center;"> <p>≥ 80</p> </td> </tr> </table>		<p>Likely PI Scoring Level (<60, 60-79, ≥ 80)</p>	<p>≥ 80</p>
<p>Likely PI Scoring Level (<60, 60-79, ≥ 80)</p>	<p>≥ 80</p>		

Evaluation Table for PI 3.2.1 Fishery-specific objectives

PI 3.2.1	The fishery-specific management system has clear, specific objectives designed to achieve the outcomes expressed by MSC's Principles 1 and 2.		
Scoring Issue	SG 60	SG 80	SG 100
a	Objectives		
Guidepost	Objectives, which are broadly consistent with achieving the outcomes expressed by MSC's Principles 1 and 2, are implicit within the fishery-specific management system.	Short and long-term objectives, which are consistent with achieving the outcomes expressed by MSC's Principles 1 and 2, are explicit within the fishery-specific management system.	Well defined and measurable short and long-term objectives, which are demonstrably consistent with achieving the outcomes expressed by MSC's Principles 1 and 2, are explicit within the fishery-specific management system.
Met?	(Y/N/Partial)	Yes, partially, there is a PFMP that caters for the industrial fisheries and the review of this plan has targeted research on the artisanal sector of this fishery	(Y/N/Partial)
Overall PI justification	PFMP that partially caters for the industrial fisheries and the review of this plan has targeted research on the artisanal sector of this fishery		
References	GOK, 2010		
		Likely PI Scoring Level (<60, 60-79, ≥ 80)	60-79

Evaluation Table for PI 3.2.2 – Decision-making processes

PI 3.2.2	The fishery-specific management system includes effective decision-making processes that result in measures and strategies to achieve the objectives, and has an appropriate approach to actual disputes in the fishery.		
Scoring Issue	SG 60	SG 80	SG 100
a	Decision-making processes		
Guidepost	There are some decision-making processes in place that result in measures and strategies to achieve the fishery-specific objectives.	There are established decision-making processes that result in measures and strategies to achieve the fishery-specific objectives.	
Met?	(Y/N)	BMU regulations and decision making structures, the EAF approach which has been streamlined and incorporated in management	
b	Responsiveness of decision-making processes		

PI 3.2.2		The fishery-specific management system includes effective decision-making processes that result in measures and strategies to achieve the objectives, and has an appropriate approach to actual disputes in the fishery.		
	Guidepost	Decision-making processes respond to serious issues identified in relevant research, monitoring, evaluation and consultation, in a transparent, timely and adaptive manner and take some account of the wider implications of decisions.	Decision-making processes respond to serious and other important issues identified in relevant research, monitoring, evaluation and consultation, in a transparent, timely and adaptive manner and take account of the wider implications of decisions.	Decision-making processes respond to all issues identified in relevant research, monitoring, evaluation and consultation, in a transparent, timely and adaptive manner and take account of the wider implications of decisions.
	Met?	(Y/N)	Responds only to serious and other important issues esp. with regards to fisheries, conflicts, ecosystems, gear trials, governance, investments in to the fishery etc,	(Y/N)
c Use of precautionary approach				
	Guidepost		Decision-making processes use the precautionary approach and are based on best available information.	
	Met?		EAF approach well streamlined and incorporated in management	
d Accountability and transparency of management system and decision-making process				
	Guidepost	Some information on the fishery's performance and management action is generally available on request to stakeholders.	Information on the fishery's performance and management action is available on request , and explanations are provided for any actions or lack of action associated with findings and relevant recommendations emerging from research, monitoring, evaluation and review activity.	Formal reporting to all interested stakeholders provides comprehensive information on the fishery's performance and management actions and describes how the management system responded to findings and relevant recommendations emerging from research, monitoring, evaluation and review activity.
	Met?	(Y/N)	Yes, we have information on most aspects of the fishery with recommendations from research, M&E etc.	(Y/N)
e Approach to disputes				

PI 3.2.2		The fishery-specific management system includes effective decision-making processes that result in measures and strategies to achieve the objectives, and has an appropriate approach to actual disputes in the fishery.		
	Guidepost	Although the management authority or fishery may be subject to continuing court challenges, it is not indicating a disrespect or defiance of the law by repeatedly violating the same law or regulation necessary for the sustainability for the fishery.	The management system or fishery is attempting to comply in a timely fashion with judicial decisions arising from any legal challenges.	The management system or fishery acts proactively to avoid legal disputes or rapidly implements judicial decisions arising from legal challenges.
	Met?	(Y/N)	Yes, there are efforts to ensure compliance with the fishery. Feedback on research findings given to stakeholders	(Y/N)
Overall PI justification		<p>-BMU regulations and decision making structures, the EAF approach which has been streamlined and incorporated in management</p> <p>-Responds only to serious and other important issues esp. with regards to fisheries, conflicts, ecosystems, gear trials, governance, investments in to the fishery etc,</p> <p>EAF approach well streamlined and incorporated in management</p> <p>There is information on most aspects of the fishery with recommendations from research, M&E etc.</p> <p>There are efforts to ensure compliance with the fishery. Feedback on research findings given to stakeholders</p>		
References		GOK, 2010; Fisheries Development and Management Act, 2016; BMU regulations 2007		
			Likely PI Scoring Level (<60, 60-79, ≥ 80)	60-79

Evaluation Table for PI 3.2.3 – Compliance and enforcement

PI 3.2.3		Monitoring, control and surveillance mechanisms ensure the management measures in the fishery are enforced and complied with.		
Scoring Issue		SG 60	SG 80	SG 100
a	MCS implementation			
	Guidepost	Monitoring, control and surveillance mechanisms exist, and are implemented in the fishery and there is a reasonable expectation that they are effective.	A monitoring, control and surveillance system has been implemented in the fishery and has demonstrated an ability to enforce relevant management measures, strategies and/or rules.	A comprehensive monitoring, control and surveillance system has been implemented in the fishery and has demonstrated a consistent ability to enforce relevant management measures, strategies and/or rules.

PI 3.2.3		Monitoring, control and surveillance mechanisms ensure the management measures in the fishery are enforced and complied with.		
	Met?	YES, MCS mechanisms generally in place, occasionally implemented, some degree of effectiveness is evident	(Y/N)	(Y/N)
b	Sanctions			
	Guidepost	Sanctions to deal with non-compliance exist and there is some evidence that they are applied.	Sanctions to deal with non-compliance exist, are consistently applied and thought to provide effective deterrence.	Sanctions to deal with non-compliance exist, are consistently applied and demonstrably provide effective deterrence.
	Met?	YES, General sanctions exist in Fisheries Act, BMU by laws, not specific to prawn fisheries, the regulations are clear, but enforcement is still weak with little evidence available for sanctions etc.	(Y/N)	(Y/N)
c	Compliance			
	Guidepost	Fishers are generally thought to comply with the management system for the fishery under assessment, including, when required, providing information of importance to the effective management of the fishery.	Some evidence exists to demonstrate fishers comply with the management system under assessment, including, when required, providing information of importance to the effective management of the fishery.	There is a high degree of confidence that fishers comply with the management system under assessment, including, providing information of importance to the effective management of the fishery.
	Met?	(Y/N)	YES, Generally thought to comply, but no evidence exists to show compliance, information provision etc., hence there is need to develop a comprehensive MCS system	(Y/N)
d	Systematic non-compliance			
	Guidepost		There is no evidence of systematic non-compliance.	
	Met?		YES, there is no evidence of non-compliance, and	

PI 3.2.3	Monitoring, control and surveillance mechanisms ensure the management measures in the fishery are enforced and complied with.		
		generally, the fishers comply with legislation, licensing etc.	
Overall PI justification	<p>-MCS mechanisms generally in place, occasionally implemented, some degree of effectiveness is evident</p> <p>-General sanctions exist in Fisheries Act, BMU by laws, not specific to prawn fisheries, the regulations are clear, but enforcement is still weak with little evidence available for sanctions etc.</p> <p>-Generally fisheries thought to comply, but no evidence exists to show compliance, information provision etc., hence there is need to develop a comprehensive MCS system</p> <p>-No evidence of no compliance, and generally, the fishers comply with legislation, licensing etc.</p>		
References	Fisheries Development and Management Act, 2016; BMU regulations 2007		
	Likely PI Scoring Level (<60, 60-79, ≥ 80)		60-79,

Evaluation Table for PI 3.2.4 – Monitoring and management performance evaluation

PI 3.2.4	There is a system of monitoring and evaluating the performance of the fishery-specific management system against its objectives.		
	There is effective and timely review of the fishery-specific management system.		
Scoring Issue	SG 60	SG 80	SG 100
a	Evaluation coverage		
Guidepost	There are mechanisms in place to evaluate some parts of the fishery-specific management system.	There are mechanisms in place to evaluate key parts of the fishery-specific management system	There are mechanisms in place to evaluate all parts of the fishery-specific management system.
Met?	YES, efforts are made to monitor the artisanal fisheries and compare it with the commercial sector	(Y/N)	(Y/N)
b	Internal and/or external review		
Guidepost	The fishery-specific management system is subject to occasional internal review.	The fishery-specific management system is subject to regular internal and occasional external review.	The fishery-specific management system is subject to regular internal and external review.
Met?	YES, only internal, but need for external review of the stock assessments and abundance estimates	(Y/N)	(Y/N)
Overall PI justification	efforts are made to monitor the artisanal fisheries and compare it with the commercial sector		

PI 3.2.4	There is a system of monitoring and evaluating the performance of the fishery-specific management system against its objectives. There is effective and timely review of the fishery-specific management system.
	only internal reviews, but need for external review of the stock assessments and abundance estimates
References	Stakeholder minutes
	Likely PI Scoring Level (<60, 60-79, ≥ 80)
	<60

Appendix 8: MSC's BMT Baseline Status & 5-year Projections for Small-scale Prawn Seine Fishery

Principle	Component	Performance Indicator	Actual 2019	Expected 2020	Expected 2021	Expected 2022	Expected 2023
1	Outcome	1.1.1 Stock status	60-79	60-79	60-79	60-79	≥80
		1.1.2 Stock rebuilding	60-79	60-79	60-79	60-79	60-79
	Management	1.2.1 Harvest Strategy	<60	<60	<60	60-79	60-79
		1.2.2 Harvest control rules and	60-79	60-79	60-79	60-79	≥80
		1.2.3 Information and monitoring	60-79	60-79	60-79	≥80	≥80
	1.2.4 Assessment of stock status	≥80	≥80	≥80	≥80	≥80	
2	Primary species	2.1.1 Outcome	60-79	60-79	60-79	60-79	≥80
		2.1.2 Management	60-79	60-79	60-79	60-79	≥80
		2.1.3 Information	≥80	≥80	≥80	≥80	≥80
	Secondary species	2.2.1 Outcome	<60	<60	<60	60-79	60-79
		2.2.2 Management	<60	<60	<60	60-79	60-79
		2.2.3 Information	<60	<60	60-79	60-79	≥80
	ETP species	2.3.1 Outcome	60-79	60-79	60-79	60-79	≥80
		2.3.2 Management	60-79	60-79	60-79	60-79	≥80
		2.3.3 Information	60-79	60-79	60-79	≥80	≥80
	Habitats	2.4.1 Outcome	<60	<60	<60	60-79	60-79
		2.4.2 Management	<60	<60	<60	60-79	≥80
		2.4.3 Information	<60	<60	60-79	60-79	≥80
	Ecosystem	2.5.1 Outcome	60-79	60-79	60-79	≥80	≥80
2.5.2 Management		<60	<60	60-79	60-79	60-79	
2.5.3 Information		≥80	≥80	≥80	≥80	≥80	
3	Governance and Policy	3.1.1 Legal and customary	60-79	60-79	60-79	60-79	60-79
		3.1.2 Consultation, roles & responsibilities	≥80	≥80	≥80	≥80	≥80
		3.1.3 Long term objectives	≥80	≥80	≥80	≥80	≥80
	Fishery specific management system	3.2.1 Fishery specific objectives	60-79	60-79	≥80	≥80	≥80
		3.2.2 Decision making processes	60-79	60-79	≥80	≥80	≥80
		3.2.3 Compliance and	60-79	60-79	60-79	≥80	≥80
		3.2.4 Management performance evaluation	<60	<60	60-79	60-79	≥80
Total number of PIs equal to or greater than 80			5	5	7	11	21
Total number of PIs 60-79			14	14	16	17	7
Total number of PIs less than 60			9	9	5	0	0
Overall BMT Index			0.43	0.43	0.54	0.70	0.88

Appendix 9: MSC Pre-assessment Results for the Octopus Fishery

Principle 1 Sustainability of exploited fish stocks

Evaluation Table for PI 1.1.1 – Stock status

PI 1.1.1	The stock is at a level which maintains high productivity and has a low probability of recruitment overfishing		
Scoring Issue	SG 60	SG 80	SG 100
a	Stock status relative to recruitment impairment		
Guidepost	It is likely that the stock is above the point where recruitment would be impaired (PRI).	It is highly likely that the stock is above the PRI.	There is a high degree of certainty that the stock is above the PRI.
Met?	NO, but $L_{mat}=10.8cm$, DML common landed classes are 10-12cm = heavy fishing pressure, but CPUE trends increasing don't signal a case of overfishing	(Y/N)	(Y/N)
b	Stock status in relation to achievement of MSY		
Guidepost		The stock is at or fluctuating around a level consistent with MSY.	There is a high degree of certainty that the stock has been fluctuating around a level consistent with MSY or has been above this level over recent years.
Met?		Yes, likely that the landings are just on the verge of tip-over, if additional pressure is introduced; evident from L_{mat} & commonly landed sizes	(Y/N)
Overall PI justification	$L_{mat}=10.8cm$, DML common landed classes are 10-12cm = heavy fishing pressure, but CPUE trends increasing don't signal a case of overfishing likely that the landings are just on the verge of tip-over, if additional pressure is introduced; evident from L_{mat} & commonly landed sizes		
References	Fondo, 2005; Fondo 2008; Everett et al., 2012; Kimani and Okemwa 2018; Kivengea 2014		
RBF Required? (✓/✗/)	✓ RBF Required	Likely PI Scoring Level (<60, 60-79, ≥ 80)	<60
Stock Status relative to Reference Points			
	Type of reference point	Value of reference point	Current stock status relative to reference point
Reference point used in scoring stock relative to PRI (SIa)	NO, but $L_{mat}=10.8cm$, DML common landed classes are 10-12cm = heavy fishing pressure, but CPUE trends increasing don't signal a case of overfishing	unknown	unknown point
Reference point used in scoring	unknown	unknown total stock biomass	Unknown reference point

PI 1.1.1	The stock is at a level which maintains high productivity and has a low probability of recruitment overfishing		
Scoring Issue	SG 60	SG 80	SG 100
stock relative to MSY (S1b)			

Evaluation Table for PI 1.1.1A - key LTL [NOTE: only use this table for stocks identified as key LTL]

PI 1.1.1 A	The stock is at a level which has a low probability of serious ecosystem impacts		
Scoring Issue	SG 60	SG 80	SG 100
a	Stock status relative to ecosystem impairment		
Guidepost	It is likely that the stock is above the point where serious ecosystem impacts could occur.	It is highly likely that the stock is above the point where serious ecosystem impacts could occur.	There is a high degree of certainty that the stock is above the point where serious ecosystem impacts could occur.
Met?	(Y/N)	(Y/N)	(Y/N)
b	Stock status in relation to ecosystem needs		
Guidepost		The stock is at or fluctuating around a level consistent with ecosystem needs.	There is a high degree of certainty that the stock has been fluctuating around a level consistent with ecosystem needs or has been above this level over recent years.
Met?		(Y/N)	(Y/N)
Overall PI justification	N/A		
References	N/A		
RBF Required? (✓/×/)	N/A	Likely PI Scoring Level (<60, 60-79, ≥ 80)	N/A
Stock Status relative to Reference Points			
	Type of reference point	Value of reference point	Current stock status relative to reference point
Reference point used in scoring stock relative to ecosystem impairment (S1a)	[e.g. B _{35%}]	[Include value specifying units. e.g. 50,000t total stock biomass]	[Include current stock status in the same units as the reference point e.g. 90,000/B _{35%} =1.8]
Reference point used in scoring stock relative to ecosystem needs (S1b)	[e.g. B _{75%}]	[Include value specifying units. e.g. 100,000t total stock biomass]	[Include current stock status in the same units as the reference point e.g. 90,000/B _{75%} =0.9]

Evaluation Table for PI 1.1.2 – Stock rebuilding

PI 1.1.2	Where the stock is reduced, there is evidence of stock rebuilding within a specified timeframe		
Scoring Issue	SG 60	SG 80	SG 100
a	Rebuilding timeframes		

PI 1.1.2		Where the stock is reduced, there is evidence of stock rebuilding within a specified timeframe		
	Guidepost	A rebuilding timeframe is specified for the stock that is the shorter of 20 years or 2 times its generation time . For cases where 2 generations is less than 5 years, the rebuilding timeframe is up to 5 years.		The shortest practicable rebuilding timeframe is specified which does not exceed one generation time for the stock.
	Met?	(Y/N)		(Y/N)
b		Rebuilding evaluation		
	Guidepost	Monitoring is in place to determine whether the rebuilding strategies are effective in rebuilding the stock within the specified timeframe.	There is evidence that the rebuilding strategies are rebuilding stocks, or it is likely based on simulation modelling, exploitation rates or previous performance that they will be able to rebuild the stock within the specified timeframe.	There is strong evidence that the rebuilding strategies are rebuilding stocks, or it is highly likely based on simulation modelling, exploitation rates or previous performance that they will be able to rebuild the stock within the specified timeframe.
	Met?	(Y/N)	(Y/N)	(Y/N)
Overall PI justification		The stock status is unknown		
References				
			Likely PI Scoring Level (<60, 60-79, ≥ 80)	NO SCORE

Evaluation Table for PI 1.2.1 – Harvest strategy

PI 1.2.1		There is a robust and precautionary harvest strategy in place		
Scoring Issue		SG 60	SG 80	SG 100
a		Harvest strategy design		
	Guidepost	The harvest strategy is expected to achieve stock management objectives reflected in PI 1.1.1 SG80.	The harvest strategy is responsive to the state of the stock and the elements of the harvest strategy work together towards achieving stock management objectives reflected in PI 1.1.1 SG80.	The harvest strategy is responsive to the state of the stock and is designed to achieve stock management objectives reflected in PI 1.1.1 SG80.
	Met?	(/N)	(Y/N)	(Y/N)
b		Harvest strategy evaluation		
	Guidepost	The harvest strategy is likely to work based on prior experience or plausible argument.	The harvest strategy may not have been fully tested but evidence exists that it is achieving its objectives.	The performance of the harvest strategy has been fully evaluated and evidence exists to show that it is achieving its objectives including being clearly able to

PI 1.2.1		There is a robust and precautionary harvest strategy in place		
				maintain stocks at target levels.
	Met?	(N)	(Y/N)	(Y/N)
c		Harvest strategy monitoring		
	Guidepost	Monitoring is in place that is expected to determine whether the harvest strategy is working.		
	Met?	(N)		
d		Harvest strategy review		
	Guidepost			The harvest strategy is periodically reviewed and improved as necessary.
	Met?	(N)		(Y/N)
e		Shark finning		
	Guidepost	It is likely that shark finning is not taking place.	It is highly likely that shark finning is not taking place.	There is a high degree of certainty that shark finning is not taking place.
	Met?	(Y/N/Not relevant)	(Y/N/Not relevant)	(Y/N/Not relevant)
f		Review of alternative measures		
	Guidepost	There has been a review of the potential effectiveness and practicality of alternative measures to minimize UoA-related mortality of unwanted catch of the target stock.	There is a regular review of the potential effectiveness and practicality of alternative measures to minimize UoA-related mortality of unwanted catch of the target stock and they are implemented as appropriate.	There is a biennial review of the potential effectiveness and practicality of alternative measures to minimize UoA-related mortality of unwanted catch of the target stock, and they are implemented, as appropriate.
	Met?	(Y/N/Not relevant)	(Y/N/Not relevant)	(Y/N/Not relevant)
Overall PI justification		None available		
References				
			Likely PI Scoring Level (<60, 60-79, ≥ 80)	<60

Evaluation Table for PI 1.2.2 – Harvest control rules and tools

PI 1.2.2		There are well defined and effective harvest control rules (HCRs) in place		
Scoring Issue		SG 60	SG 80	SG 100
a		HCRs design and application		
	Guidepost	Generally understood HCRs are in place or available that are expected to reduce the exploitation rate as the point of recruitment impairment (PRI) is approached.	Well defined HCRs are in place that ensure that the exploitation rate is reduced as the PRI is approached, are expected to keep the stock fluctuating around a target level consistent with (or above) MSY, or for key	The HCRs are expected to keep the stock fluctuating at or above a target level consistent with MSY, or another more appropriate level taking into account the ecological role of the stock, most of the time.

PI 1.2.2		There are well defined and effective harvest control rules (HCRs) in place		
			LTL species a level consistent with ecosystem needs.	
	Met?	(N)	(Y/N)	
b		HCRs robustness to uncertainty		
	Guidepost		The HCRs are likely to be robust to the main uncertainties.	The HCRs take account of a wide range of uncertainties including the ecological role of the stock, and there is evidence that the HCRs are robust to the main uncertainties.
	Met?		(N)	(Y/N)
c		HCRs evaluation		
	Guidepost	There is some evidence that tools used or available to implement HCRs are appropriate and effective in controlling exploitation.	Available evidence indicates that the tools in use are appropriate and effective in achieving the exploitation levels required under the HCRs.	Evidence clearly shows that the tools in use are effective in achieving the exploitation levels required under the HCRs.
	Met?	(N)	(Y/N)	(Y/N)
Overall PI justification		None		
References				
			Likely PI Scoring Level (<60, 60-79, ≥ 80)	<60

Evaluation Table for PI 1.2.3 – Information and monitoring

PI 1.2.3		Relevant information is collected to support the harvest strategy		
Scoring Issue		SG 60	SG 80	SG 100
a		Range of information		
	Guidepost	Some relevant information related to stock structure, stock productivity and fleet composition is available to support the harvest strategy.	Sufficient relevant information related to stock structure, stock productivity, fleet composition and other data is available to support the harvest strategy.	A comprehensive range of information (on stock structure, stock productivity, fleet composition, stock abundance, UoA removals and other information such as environmental information), including some that may not be directly related to the current harvest strategy, is available.
	Met?	(N)	(Y/N)	(Y/N)
b		Monitoring		
	Guidepost	Stock abundance and UoA removals are monitored and at least one indicator is available and monitored with sufficient frequency to support the harvest control rule.	Stock abundance and UoA removals are regularly monitored at a level of accuracy and coverage consistent with the harvest control rule , and one or more indicators are available and monitored	All information required by the harvest control rule is monitored with high frequency and a high degree of certainty, and there is a good understanding of inherent uncertainties in the

PI 1.2.3	Relevant information is collected to support the harvest strategy		
			with sufficient frequency to support the harvest control rule.
			information [data] and the robustness of assessment and management to this uncertainty.
Met?	(N)	(Y/N)	(Y/N)
c	Comprehensiveness of information		
Guidepost		There is good information on all other fishery removals from the stock.	
Met?		(Y/N)	
Overall PI justification	None		
References	None		
		Likely PI Scoring Level (<60, 60-79, ≥ 80)	<60

Evaluation Table for PI 1.2.4 – Assessment of stock status

PI 1.2.4	There is an adequate assessment of the stock status		
Scoring Issue	SG 60	SG 80	SG 100
a	Appropriateness of assessment to stock under consideration		
Guidepost		The assessment is appropriate for the stock and for the harvest control rule.	The assessment takes into account the major features relevant to the biology of the species and the nature of the UoA.
Met?		(N)	(Y/N)
b	Assessment approach		
Guidepost	The assessment estimates stock status relative to generic reference points appropriate to the species category.	The assessment estimates stock status relative to reference points that are appropriate to the stock and can be estimated.	
Met?	(N)	(Y/N)	
c	Uncertainty in the assessment		
Guidepost	The assessment identifies major sources of uncertainty.	The assessment takes uncertainty into account.	The assessment takes into account uncertainty and is evaluating stock status relative to reference points in a probabilistic way.
Met?	(Y/N)	(Y/N)	(Y/N)
d	Evaluation of assessment		
Guidepost			The assessment has been tested and shown to be robust. Alternative hypotheses and assessment approaches have been rigorously explored.
Met?			(Y/N)
e	Peer review of assessment		
Guidepost		The assessment of stock status is subject to peer review.	The assessment has been internally and externally peer reviewed.
Met?		(Y/N)	(Y/N)

PI 1.2.4	There is an adequate assessment of the stock status		
Overall PI justification	Information is significantly lacking		
References	None available		
		Likely PI Scoring Level (<60, 60-79, ≥ 80)	<60

Principle 2 Maintenance of the fishery ecosystem

Evaluation Table for PI 2.1.1 – Primary species outcome

PI 2.1.1	The UoA aims to maintain primary species above the PRI and does not hinder recovery of primary species if they are below the PRI.		
Scoring Issue	SG 60	SG 80	SG 100
a	Main primary species stock status		
Guidepost	Main primary species are likely to be above the PRI OR If the species is below the PRI, the UoA has measures in place that are expected to ensure that the UoA does not hinder recovery and rebuilding.	Main primary species are highly likely to be above the PRI OR If the species is below the PRI, there is either evidence of recovery or a demonstrably effective strategy in place between all MSC UoAs which categorize this species as main , to ensure that they collectively do not hinder recovery and rebuilding.	There is a high degree of certainty that main primary species are above the PRI and are fluctuating around a level consistent with MSY.
Met?	(Y/N)	(Y/N)	(Y/N)
b	Minor primary species stock status		
Guidepost			Minor primary species are highly likely to be above the PRI OR If below the PRI, there is evidence that the UoA does not hinder the recovery and rebuilding of minor primary species
Met?			(Y/N)
Overall PI justification	Information is evidently lacking		
References	None available for scoring		
RBF Required? (✓/✗/)	✓ RBF required	Likely PI Scoring Level (<60, 60-79, ≥ 80)	<60

Evaluation Table for PI 2.1.2 – Primary species management strategy

PI 2.1.2	There is a strategy in place that is designed to maintain or to not hinder rebuilding of primary species, and the UoA regularly reviews and implements measures, as appropriate, to minimize the mortality of unwanted catch.		
Scoring Issue	SG 60	SG 80	SG 100
a	Management strategy in place		

PI 2.1.2		There is a strategy in place that is designed to maintain or to not hinder rebuilding of primary species, and the UoA regularly reviews and implements measures, as appropriate, to minimize the mortality of unwanted catch.		
	Guidepost	There are measures in place for the UoA, if necessary, that are expected to maintain or to not hinder rebuilding of the main primary species at/to levels which are likely to be above the point where recruitment would be impaired.	There is a partial strategy in place for the UoA, if necessary, that is expected to maintain or to not hinder rebuilding of the main primary species at/to levels which are highly likely to be above the point where recruitment would be impaired.	There is a strategy in place for the UoA for managing main and minor primary species.
	Met?	(Y/N)	(Y/N)	(Y/N)
b	Management strategy evaluation			
	Guidepost	The measures are considered likely to work, based on plausible argument (e.g., general experience, theory or comparison with similar fisheries/species).	There is some objective basis for confidence that the measures/partial strategy will work, based on some information directly about the fishery and/or species involved.	Testing supports high confidence that the partial strategy/strategy will work, based on information directly about the fishery and/or species involved.
	Met?	(Y/N)	(Y/N)	(Y/N)
c	Management strategy implementation			
	Guidepost		There is some evidence that the measures/partial strategy is being implemented successfully .	There is clear evidence that the partial strategy/strategy is being implemented successfully and is achieving its overall objective as set out in scoring issue (a).
	Met?		(Y/N)	(Y/N)
d	Shark finning			
	Guidepost	It is likely that shark finning is not taking place.	It is highly likely that shark finning is not taking place.	There is a high degree of certainty that shark finning is not taking place.
	Met?	(Y/N/Not relevant)	(Y/N/Not relevant)	(Y/N/Not relevant)
e	Review of alternative measures			
	Guidepost	There is a review of the potential effectiveness and practicality of alternative measures to minimize UoA-related mortality of unwanted catch of main primary species.	There is a regular review of the potential effectiveness and practicality of alternative measures to minimize UoA-related mortality of unwanted catch of main primary species and they are implemented as appropriate.	There is a biennial review of the potential effectiveness and practicality of alternative measures to minimize UoA-related mortality of unwanted catch of all primary species, and they are implemented, as appropriate.
	Met?	(Y/N/Not relevant)	(Y/N/Not relevant)	(Y/N/Not relevant)
Overall PI justification		[Note: Insert text to justify the likely scoring level achieved for this PI, please refer to individual scoring issues]		
References				
			Likely PI Scoring Level (<60, 60-79, ≥ 80)	<60

Evaluation Table for PI 2.1.3 – Primary species information

PI 2.1.3	Information on the nature and extent of primary species is adequate to determine the risk posed by the UoA and the effectiveness of the strategy to manage primary species		
Scoring Issue	SG 60	SG 80	SG 100
a	Information adequacy for assessment of impact on main primary species		
Guidepost	Qualitative information is adequate to estimate the impact of the UoA on the main primary species with respect to status. OR If RBF is used to score PI 2.1.1 for the UoA: Qualitative information is adequate to estimate productivity and susceptibility attributes for main primary species.	Some quantitative information is available and is adequate to assess the impact of the UoA on the main primary species with respect to status. OR If RBF is used to score PI 2.1.1 for the UoA: Some quantitative information is adequate to assess productivity and susceptibility attributes for main primary species.	Quantitative information is available and is adequate to assess with a high degree of certainty the impact of the UoA on main primary species with respect to status.
Met?	(Y/N)	(Y/N)	(Y/N)
b	Information adequacy for assessment of impact on minor primary species		
Guidepost			Some quantitative information is adequate to estimate the impact of the UoA on minor primary species with respect to status.
Met?			(Y/N)
c	Information adequacy for management strategy		
Guidepost	Information is adequate to support measures to manage main primary species.	Information is adequate to support a partial strategy to manage main Primary species.	Information is adequate to support a strategy to manage all primary species, and evaluate with a high degree of certainty whether the strategy is achieving its objective.
Met?	(Y/N)	(Y/N)	(Y/N)
Overall PI justification			
References			
	Likely PI Scoring Level (<60, 60-79, ≥ 80)	<60	

Evaluation Table for PI 2.2.1 – Secondary species outcome

PI 2.2.1	The UoA aims to maintain secondary species above a biologically based limit and does not hinder recovery of secondary species if they are below a biological based limit.		
Scoring Issue	SG 60	SG 80	SG 100
a	Main secondary species stock status		
Guidepost	Main Secondary species are likely to be within biologically based limits. OR If below biologically based limits, there are measures in place expected to ensure that the UoA does not hinder recovery and rebuilding.	Main secondary species are highly likely to be above biologically based limits OR If below biologically based limits, there is either evidence of recovery or a demonstrably effective partial strategy in place such that the UoA does not hinder recovery and rebuilding. AND Where catches of a main secondary species outside of biological limits are considerable, there is either evidence of recovery or a, demonstrably effective strategy in place between those MSC UoAs that also have considerable catches of the species, to ensure that they collectively do not hinder recovery and rebuilding.	There is a high degree of certainty that main secondary species are within biologically based limits.
Met?	(N)	(Y/N)	(Y/N)
b	Minor secondary species stock status		
Guidepost			Minor secondary species are highly likely to be above biologically based limits. OR If below biologically based limits', there is evidence that the UoA does not hinder the recovery and rebuilding of secondary species
Met?			(N)
Overall PI justification	Lack of quantifiable information to score		
References	None available		
RBF Required? (✓/x/)	X	Likely PI Scoring Level (<60, 60-79, ≥ 80)	NO SCORE

Evaluation Table for PI 2.2.2 – Secondary species management strategy

PI 2.2.2	There is a strategy in place for managing secondary species that is designed to maintain or to not hinder rebuilding of secondary species and the UoA regularly reviews and implements measures, as appropriate, to minimize the mortality of unwanted catch.		
Scoring Issue	SG 60	SG 80	SG 100
a	Management strategy in place		
Guidepost	There are measures in place, if necessary, which are expected to maintain or not hinder rebuilding of main secondary species at/to levels which are highly likely to be within biologically based limits or to ensure that the UoA does not hinder their recovery.	There is a partial strategy in place, if necessary, for the UoA that is expected to maintain or not hinder rebuilding of main secondary species at/to levels which are highly likely to be within biologically based limits or to ensure that the UoA does not hinder their recovery.	There is a strategy in place for the UoA for managing main and minor secondary species.
Met?	(N)	(Y/N)	(Y/N)
b	Management strategy evaluation		
Guidepost	The measures are considered likely to work, based on plausible argument (e.g. general experience, theory or comparison with similar UoAs/species).	There is some objective basis for confidence that the measures/partial strategy will work, based on some information directly about the UoA and/or species involved.	Testing supports high confidence that the partial strategy/strategy will work, based on information directly about the UoA and/or species involved.
Met?	(N)	(Y/N)	(Y/N)
c	Management strategy implementation		
Guidepost		There is some evidence that the measures/partial strategy is being implemented successfully .	There is clear evidence that the partial strategy/strategy is being implemented successfully and is achieving its objective as set out in scoring issue (a).
Met?		(N)	(Y/N)
d	Shark finning		
Guidepost	It is likely that shark finning is not taking place.	It is highly likely that shark finning is not taking place.	There is a high degree of certainty that shark finning is not taking place.
Met?	(Y/N/Not relevant)	(Y/N/Not relevant)	(Y/N/Not relevant)
e	Review of alternative measures to minimize mortality of unwanted catch [Scoring issue need not be scored if are no unwanted catches of secondary species]		
Guidepost	There is a review of the potential effectiveness and practicality of alternative measures to minimize UoA-related mortality of unwanted catch of main secondary species.	There is a regular review of the potential effectiveness and practicality of alternative measures to minimize UoA-related mortality of unwanted catch of main secondary species and they are implemented as appropriate.	There is a biennial review of the potential effectiveness and practicality of alternative measures to minimize UoA-related mortality of unwanted catch of all secondary species, and they are implemented, as appropriate.

PI 2.2.2	There is a strategy in place for managing secondary species that is designed to maintain or to not hinder rebuilding of secondary species and the UoA regularly reviews and implements measures, as appropriate, to minimize the mortality of unwanted catch.		
Met?	(Y/N/Not relevant)	(Y/N/Not relevant)	(Y/N/Not relevant)
Overall PI justification	No available management strategy for managing secondary species associated		
References	Kivengea, 2014; Fondo, 2005		
		Likely PI Scoring Level (<60, 60-79, ≥ 80)	NO SCORE

Evaluation Table for PI 2.2.3 – Secondary species information

PI 2.2.3	Information on the nature and amount of secondary species taken is adequate to determine the risk posed by the UoA and the effectiveness of the strategy to manage secondary species.		
Scoring Issue	SG 60	SG 80	SG 100
a	Information adequacy for assessment of impacts on main secondary species		
Guidepost	Qualitative information is adequate to estimate the impact of the UoA on the main secondary species with respect to status. OR If RBF is used to score PI 2.2.1 for the UoA: Qualitative information is adequate to estimate productivity and susceptibility attributes for main secondary species.	Some quantitative information is available and adequate to assess the impact of the UoA on main secondary species with respect to status. OR If RBF is used to score PI 2.2.1 for the UoA: Some quantitative information is adequate to assess productivity and susceptibility attributes for main secondary species.	Quantitative information is available and adequate to assess with a high degree of certainty the impact of the UoA on main secondary species with respect to status.
Met?	(N)	(Y/N)	(Y/N)
b	Information adequacy for assessment of impacts on minor secondary species		
Guidepost			Some quantitative information is adequate to estimate the impact of the UoA on minor secondary species with respect to status.
Met?			(N)
c	Information adequacy for management strategy		
Guidepost	Information is adequate to support measures to manage main secondary species.	Information is adequate to support a partial strategy to manage main secondary species.	Information is adequate to support a strategy to manage all secondary species, and evaluate with a high degree of certainty whether the strategy is achieving its objective .
Met?	(N)	(Y/N)	(Y/N)
Overall PI justification	Data and information is evidently lacking		
References	Not available		

PI 2.2.3	Information on the nature and amount of secondary species taken is adequate to determine the risk posed by the UoA and the effectiveness of the strategy to manage secondary species.	Likely PI Scoring Level (<60, 60-79, ≥ 80)	NO SCORE

Evaluation Table for PI 2.3.1 – ETP species outcome

PI 2.3.1	The UoA meets national and international requirements for the protection of ETP species The UoA does not hinder recovery of ETP species			
Scoring Issue	SG 60	SG 80	SG 100	
a	Effects of the UoA on population/stock within national or international limits, where applicable [Scoring issue need not be scored if there are no national or international requirements that set limits for ETP species].			
	Guidepost	Where national and/or international requirements set limits for ETP species, the effects of the UoA on the population/stock are known and likely to be within these limits.	Where national and/or international requirements set limits for ETP species, the combined effects of the MSC UoAs on the population/stock are known and highly likely to be within these limits.	Where national and/or international requirements set limits for ETP species, there is a high degree of certainty that the combined effects of the MSC UoAs are within these limits.
	Met?	(Y)	(Y/N/Not relevant)	(Y/N/Not relevant)
b	Direct effects			
	Guidepost	Known direct effects of the UoA are likely to not hinder recovery of ETP species.	Known direct effects of the UoA are highly likely to not hinder recovery of ETP species.	There is a high degree of confidence that there are no significant detrimental direct effects of the UoA on ETP species.
	Met?	(Y)	(Y/N)	(Y/N)
c	Indirect effects			
	Guidepost		Indirect effects have been considered and are thought to be highly likely to not create unacceptable impacts.	There is a high degree of confidence that there are no significant detrimental indirect effects of the fishery on ETP species.
	Met?		(Y)	(Y/N)
Overall PI justification	Gear operation has no interactions with the ETPs			
References	Melitas et al., Anderson, 2003; Mbaru 2012			
RBF Required? (✓/✗/)	X	Likely PI Scoring Level (<60, 60-79, ≥ 80)	60-79	

Evaluation Table for PI 2.3.2 – ETP species management strategy

PI 2.3.2	<p>The UoA has in place precautionary management strategies designed to:</p> <ul style="list-style-type: none"> • meet national and international requirements; • ensure the UoA does not hinder recovery of ETP species. <p>Also, the UoA regularly reviews and implements measures, as appropriate, to minimize the mortality of ETP species.</p>		
Scoring Issue	SG 60	SG 80	SG 100
a	<p>Management strategy in place (national and international requirements) [Scoring issue need not be scored if there are <u>no</u> requirements for protection or rebuilding provided through national ETP legislation or international agreements].</p>		
Guidepost	There are measures in place that minimize the UoA-related mortality of ETP species, and are expected to be highly likely to achieve national and international requirements for the protection of ETP species.	There is a strategy in place for managing the UoA's impact on ETP species, including measures to minimize mortality, which is designed to be highly likely to achieve national and international requirements for the protection of ETP species.	There is a comprehensive strategy in place for managing the UoA's impact on ETP species, including measures to minimize mortality, which is designed to achieve above national and international requirements for the protection of ETP species.
Met?	Not relevant	(Y/N/Not relevant)	(Y/N/Not relevant)
b	<p>Management strategy in place (alternative) [Scoring issue need not be scored if there are requirements for protection or rebuilding provided through national ETP legislation or international agreements].</p>		
Guidepost	There are measures in place that are expected to ensure the UoA does not hinder the recovery of ETP species.	There is a strategy in place that is expected to ensure the UoA does not hinder the recovery of ETP species.	There is a comprehensive strategy in place for managing ETP species, to ensure the UoA does not hinder the recovery of ETP species
Met?	Not relevant	(Y/N/Not relevant)	(Y/N/Not relevant)
c	<p>Management strategy evaluation</p>		
Guidepost	The measures are considered likely to work, based on plausible argument (e.g. general experience, theory or comparison with similar fisheries/species).	There is an objective basis for confidence that the measures/strategy will work, based on information directly about the fishery and/or the species involved.	The strategy/comprehensive strategy is mainly based on information directly about the fishery and/or species involved, and a quantitative analysis supports high confidence that the strategy will work.
Met?	None in place	(Y/N)	(Y/N)
d	<p>Management strategy implementation</p>		
Guidepost		There is some evidence that the measures/strategy is being implemented successfully.	There is clear evidence that the strategy/comprehensive strategy is being implemented successfully and is achieving its objective as set out in scoring issue (a) or (b).
Met?		(N) No strategy, no measures, no evidence of implementation	(Y/N)

PI 2.3.2		<p>The UoA has in place precautionary management strategies designed to:</p> <ul style="list-style-type: none"> • meet national and international requirements; • ensure the UoA does not hinder recovery of ETP species. <p>Also, the UoA regularly reviews and implements measures, as appropriate, to minimize the mortality of ETP species.</p>		
e	Review of alternative measures to minimize mortality of ETP species			
	Guidepost	There is a review of the potential effectiveness and practicality of alternative measures to minimize UoA-related mortality of ETP species.	There is a regular review of the potential effectiveness and practicality of alternative measures to minimize UoA-related mortality of ETP species and they are implemented as appropriate.	There is a biennial review of the potential effectiveness and practicality of alternative measures to minimize UoA-related mortality ETP species, and they are implemented, as appropriate.
	Met?	(Y/N)	(Y/N)	(Y/N)
Overall PI justification				
References				
			Likely PI Scoring Level (<60, 60-79, ≥ 80)	NO SCORES

Evaluation Table for PI 2.3.3 – ETP species information

PI 2.3.3		<p>Relevant information is collected to support the management of UoA impacts on ETP species, including:</p> <ul style="list-style-type: none"> • Information for the development of the management strategy; • Information to assess the effectiveness of the management strategy; and • Information to determine the outcome status of ETP species. 		
Scoring Issue		SG 60	SG 80	SG 100
a	Information adequacy for assessment of impacts			
	Guidepost	Qualitative information is adequate to estimate the UoA related mortality on ETP species. OR If RBF is used to score PI 2.3.1 for the UoA: Qualitative information is adequate to estimate productivity and susceptibility attributes for ETP species.	Some quantitative information is adequate to assess the UoA related mortality and impact and to determine whether the UoA may be a threat to protection and recovery of the ETP species. OR If RBF is used to score PI 2.3.1 for the UoA: Some quantitative information is adequate to assess productivity and susceptibility attributes for ETP species.	Quantitative information is available to assess with a high degree of certainty the magnitude of UoA-related impacts, mortalities and injuries and the consequences for the status of ETP species.
	Met?	No interactions with gear	(Y/N)	(Y/N)
b	Information adequacy for management strategy			
	Guidepost	Information is adequate to support measures to manage the impacts on ETP species.	Information is adequate to measure trends and support a strategy to manage impacts on ETP species.	Information is adequate to support a comprehensive strategy to manage impacts, minimize mortality and injury of ETP species, and evaluate

PI 2.3.3	Relevant information is collected to support the management of UoA impacts on ETP species, including: <ul style="list-style-type: none"> Information for the development of the management strategy; Information to assess the effectiveness of the management strategy; and Information to determine the outcome status of ETP species. 		
			with a high degree of certainty whether a strategy is achieving its objectives.
	Met?	(Y/N)	(Y/N)
Overall PI justification	The gear used do not interact with ETPs hence not relevant		
References	Omukoto et al., 2019		
		Likely PI Scoring Level (<60, 60-79, ≥ 80)	60-79

Evaluation Table for PI 2.4.1 – Habitats outcome

PI 2.4.1	The UoA does not cause serious or irreversible harm to habitat structure and function, considered on the basis of the area covered by the governance body(s) responsible for fisheries management in the area(s) where the UoA operates.		
Scoring Issue	SG 60	SG 80	SG 100
a	Commonly encountered habitat status		
	Guidepost	The UoA is unlikely to reduce structure and function of the commonly encountered habitats to a point where there would be serious or irreversible harm.	The UoA is highly unlikely to reduce structure and function of the commonly encountered habitats to a point where there would be serious or irreversible harm.
	Met?	(Y)	(Y/N)
b	VME habitat status [Scoring issue need not be scored if there are no VMEs].		
	Guidepost	The UoA is unlikely to reduce structure and function of the VME habitats to a point where there would be serious or irreversible harm.	The UoA is highly unlikely to reduce structure and function of the VME habitats to a point where there would be serious or irreversible harm.
	Met?	(Y)	(Y/N/Not relevant)
c	Minor habitat status		
	Guidepost		There is evidence that the UoA is highly unlikely to reduce structure and function of the minor habitats to a point where there would be serious or irreversible harm.
	Met?		(N)
Overall PI justification	Significant evidence is lacking on the relationship of the UoA with VMEs, however, general information indicates the unlikelihood of the fishing operations reducing the structure, function and productivity of the associated habitats		
References	Fondo; 2008		

PI 2.4.1	The UoA does not cause serious or irreversible harm to habitat structure and function, considered on the basis of the area covered by the governance body(s) responsible for fisheries management in the area(s) where the UoA operates.		
RBF Required? (✓/×/)	X	Likely PI Scoring Level (<60, 60-79, ≥ 80)	<60

Evaluation Table for PI 2.4.2 – Habitats management strategy

PI 2.4.2	There is a strategy in place that is designed to ensure the UoA does not pose a risk of serious or irreversible harm to the habitats.		
Scoring Issue	SG 60	SG 80	SG 100
a	Management strategy in place		
Guidepost	There are measures in place, if necessary, that are expected to achieve the Habitat Outcome 80 level of performance.	There is a partial strategy in place, if necessary, that is expected to achieve the Habitat Outcome 80 level of performance or above.	There is a strategy in place for managing the impact of all MSC UoAs/non-MSC fisheries on habitats.
Met?	(Y/N)	(Y/N)	YES; coral reef & Seagrass Ecosystems Conservation Strategy 2015-2019, the Co-mgt plans, CCAs, MPAs
b	Management strategy evaluation		
Guidepost	The measures are considered likely to work, based on plausible argument (e.g. general experience, theory or comparison with similar UoAs/habitats).	There is some objective basis for confidence that the measures/partial strategy will work, based on information directly about the UoA and/or habitats involved.	Testing supports high confidence that the partial strategy/strategy will work, based on information directly about the UoA and/or habitats involved.
Met?	YES, no specific considerations have been made for Octopus fisheries	(Y/N)	(Y/N)
c	Management strategy implementation		
Guidepost		There is some quantitative evidence that the measures/partial strategy is being implemented successfully.	There is clear quantitative evidence that the partial strategy/strategy is being implemented successfully and is achieving its objective, as outlined in scoring issue (a).
Met?		YES, within MPAs, CCAs, Co-mgt areas, evidence from studies & in situ monitoring programmes by WCS, CORDIO etc.	(Y/N)
d	Compliance with management requirements and other MSC UoAs'/non-MSC fisheries' measures to protect VMEs [Scoring issue need not be scored if there are no VMEs].		
Guidepost	There is qualitative evidence that the UoA complies with its management	There is some quantitative evidence that the UoA complies with both its management requirements and with protection	There is clear quantitative evidence that the UoA complies with both its management requirements and with protection

PI 2.4.2	There is a strategy in place that is designed to ensure the UoA does not pose a risk of serious or irreversible harm to the habitats.		
	requirements to protect VMEs.	measures afforded to VMEs by other MSC UoAs/non-MSC fisheries, where relevant.	measures afforded to VMEs by other MSC UoAs/non-MSC fisheries, where relevant.
Met?	YES, general compliance with protection of VMEs	(Y/N/Not relevant)	(Y/N/Not relevant)
Overall PI justification	coral reef & Sea grass Ecosystems Conservation Strategy 2015-2019, the Co-mgt plans, CCAs, MPAs no specific considerations have been made for Octopus fisheries Quantitative evidence that some measures are being implemented successfully; within MPAs, CCAs, Co-mgt areas, evidence from studies & in situ monitoring programmes by WCS, CORDIO etc		
References	Coral Reef and Sea grass Ecosystem Conservation Strategy, Reef Check; WIO Sea grass network etc.		
		Likely PI Scoring Level (<60, 60-79, ≥ 80)	60-79

Evaluation Table for PI 2.4.3 – Habitats information

PI 2.4.3	Information is adequate to determine the risk posed to the habitat by the UoA and the effectiveness of the strategy to manage impacts on the habitat.		
Scoring Issue	SG 60	SG 80	SG 100
a	Information quality		
Guidepost	The types and distribution of the main habitats are broadly understood . OR If CSA is used to score PI 2.4.1 for the UoA: Qualitative information is adequate to estimate the types and distribution of the main habitats.	The nature, distribution and vulnerability of the main habitats in the UoA area are known at a level of detail relevant to the scale and intensity of the UoA. OR If CSA is used to score PI 2.4.1 for the UoA: Some quantitative information is available and is adequate to estimate the types and distribution of the main habitats.	The distribution of all habitats is known over their range, with particular attention to the occurrence of vulnerable habitats.
Met?	(Y/N)	(Y/N)	YES, major habitats well understood including sea grass beds, reef ecosystems; a lot of info from McClanahan & team, CORDIO, KMFRI, SDF, Universities
b	Information adequacy for assessment of impacts		
Guidepost	Information is adequate to broadly understand the nature of the main impacts of gear use on the main	Information is adequate to allow for identification of the main impacts of the UoA on the main habitats, and there is reliable	The physical impacts of the gear on all habitats have been quantified fully.

PI 2.4.3		Information is adequate to determine the risk posed to the habitat by the UoA and the effectiveness of the strategy to manage impacts on the habitat.		
		habitats, including spatial overlap of habitat with fishing gear. OR If CSA is used to score PI 2.4.1 for the UoA: Qualitative information is adequate to estimate the consequence and spatial attributes of the main habitats.	information on the spatial extent of interaction and on the timing and location of use of the fishing gear. OR If CSA is used to score PI 2.4.1 for the UoA: Some quantitative information is available and is adequate to estimate the consequence and spatial attributes of the main habitats.	
	Met?	(Y)	(Y/N)	(Y/N)
c	Monitoring			
	Guidepost		Adequate information continues to be collected to detect any increase in risk to the main habitats.	Changes in habitat distributions over time are measured.
	Met?		(Y/N)	YES, considering the long monitoring by WCS, CORDIO, WWF, KMFRI,
Overall PI justification		Major habitats well understood including sea grass beds, reef ecosystems; a lot of info from McClanahan & team, CORDIO, KMFRI, SDF, Universities Habitat distribution are measured overtime considering the long monitoring by WCS, CORDIO, WWF, KMFRI		
References		WCS, CORDIO, WWF, KMFRI docs		
			Likely PI Scoring Level (<60, 60-79, ≥ 80)	60-79

Evaluation Table for PI 2.5.1 – Ecosystem outcome

PI 2.5.1		The UoA does not cause serious or irreversible harm to the key elements of ecosystem structure and function.		
Scoring Issue		SG 60	SG 80	SG 100
a	Ecosystem status			
	Guidepost	The UoA is unlikely to disrupt the key elements underlying ecosystem structure and function to a point where there would be a serious or irreversible harm.	The UoA is highly unlikely to disrupt the key elements underlying ecosystem structure and function to a point where there would be a serious or irreversible harm.	There is evidence that the UoA is highly unlikely to disrupt the key elements underlying ecosystem structure and function to a point where there would be a serious or irreversible harm.
	Met?	(Y/N/Partial)	Partial evidence is available	(Y/N/Partial)
Overall PI justification		Partial evidence is available that the UoA is highly likely to disrupt key ecosystem elements		
References		Munyi, 2009; Ochiowo, 2004; Mbuga 1984		
RBF Required? (✓/×/)		X	Likely PI Scoring Level (<60, 60-79, ≥ 80)	60-79

Evaluation Table for PI 2.5.2 – Ecosystem management strategy

PI 2.5.2	There are measures in place to ensure the UoA does not pose a risk of serious or irreversible harm to ecosystem structure and function.			
Scoring Issue	SG 60	SG 80	SG 100	
a	Management strategy in place			
	Guidepost	There are measures in place, if necessary which take into account the potential impacts of the fishery on key elements of the ecosystem.	There is a partial strategy in place, if necessary, which takes into account available information and is expected to restrain impacts of the UoA on the ecosystem so as to achieve the Ecosystem Outcome 80 level of performance.	There is a strategy that consists of a plan , in place which contains measures to address all main impacts of the UoA on the ecosystem, and at least some of these measures are in place.
	Met?	YES, no strategy but measures are in place	(Y/N)	(Y/N)
b	Management strategy evaluation			
	Guidepost	The measures are considered likely to work, based on plausible argument (e.g., general experience, theory or comparison with similar fisheries/ ecosystems).	There is some objective basis for confidence that the measures/partial strategy will work, based on some information directly about the UoA and/or the ecosystem involved	Testing supports high confidence that the partial strategy/strategy will work, based on information directly about the UoA and/or ecosystem involved
	Met?	Yes, some surveys are done and used to.	(Y/N)	(Y/N)
c	Management strategy implementation			
	Guidepost		There is some evidence that the measures/partial strategy is being implemented successfully .	There is clear evidence that the partial strategy/strategy is being implemented successfully and is achieving its objective as set out in scoring issue (a) .
	Met?		YES, Co-management, CCAs, CMAs	(Y/N)
Overall PI justification	no strategy but measures are in place for interacting ecosystem management some surveys are done indicating measures are likely to work Some evidence shows measures strategy is being implemented successfully			
References	Maina 2012			
	Likely PI Scoring Level (<60, 60-79, ≥ 80)		60-79	

Evaluation Table for PI 2.5.3 – Ecosystem information

PI 2.5.3	There is adequate knowledge of the impacts of the UoA on the ecosystem.			
Scoring Issue	SG 60	SG 80	SG 100	
a	Information quality			
	Guidepost	Information is adequate to identify the key elements of the ecosystem.	Information is adequate to broadly understand the key elements of the ecosystem.	
	Met?	(Y/N)	YES, Impacts have been documented in various studies (McClanahan et	

PI 2.5.3	There is adequate knowledge of the impacts of the UoA on the ecosystem.			
			al.) & are broadly understood	
b	Investigation of UoA impacts			
	Guidepost	Main impacts of the UoA on these key ecosystem elements can be inferred from existing information, but have not been investigated in detail.	Main impacts of the UoA on these key ecosystem elements can be inferred from existing information, and some have been investigated in detail.	Main interactions between the UoA and these ecosystem elements can be inferred from existing information, and have been investigated in detail.
	Met?	(Y, there is gaps in detailed impact of the fishery on ecosystems)	(Y/N)	(Y/N)
c	Understanding of component functions			
	Guidepost		The main functions of the components (i.e., PI target species, primary, secondary and ETP species and Habitats) in the ecosystem are known.	The impacts of the UoA on PI target species, primary, secondary and ETP species and Habitats are identified and the main functions of these components in the ecosystem are understood.
	Met?		(Y. main functions known but clear understanding calls for further investigations)	(Y/N)
d	Information relevance			
	Guide post		Adequate information is available on the impacts of the UoA on these components to allow some of the main consequences for the ecosystem to be inferred.	Adequate information is available on the impacts of the UoA on the components and elements to allow the main consequences for the ecosystem to be inferred.
	Met?		(Yes. Based on studies on spear gun impact)	(Y/N)
e	Monitoring			
	Guidepost		Adequate data continue to be collected to detect any increase in risk level.	Information is adequate to support the development of strategies to manage ecosystem impacts.
	Met?		YES, some information available for definition of strategies for ecosystem impacts managements	(Y/N)
Overall PI justification	Impacts have been documented in various studies (McClanahan et al.) & are broadly understood there is gaps in detailed impact of the fishery on ecosystems main functions known but clear understanding calls for further investigations Adequate information on impacts of UoA on ecosystem elements based on studies on spear gun impact Some information available for definition of strategies for ecosystem impacts managements			
References	Mbuga, 1984; McClanahan, 1988; Guard, 2009			
		Likely PI Scoring Level (<60, 60-79, ≥ 80)	60-79	

Principle 3 Effective and responsible management

Evaluation Table for PI 3.1.1 – Legal and/or customary framework

PI 3.1.1	The management system exists within an appropriate legal and/or customary framework which ensures that it: <ul style="list-style-type: none"> • Is capable of delivering sustainability in the UoA(s); and • Observes the legal rights created explicitly or established by custom of people dependent on fishing for food or livelihood; and • Incorporates an appropriate dispute resolution framework. 		
Scoring Issue	SG 60	SG 80	SG 100
a	Compatibility of laws or standards with effective management		
Guidepost	There is an effective national legal system and a framework for cooperation with other parties, where necessary, to deliver management outcomes consistent with MSC Principles 1 and 2	There is an effective national legal system and organised and effective cooperation with other parties, where necessary, to deliver management outcomes consistent with MSC Principles 1 and 2.	There is an effective national legal system and binding procedures governing cooperation with other parties which delivers management outcomes consistent with MSC Principles 1 and 2.
Met?	(Y/N)	YES, Fisheries law in place, BMU regulations, ICZM framework, Kenya constitution of Kenya 2010; Wildlife Act, EMCA etc.	(Y/N)
b	Resolution of disputes		
Guidepost	The management system incorporates or is subject by law to a mechanism for the resolution of legal disputes arising within the system.	The management system incorporates or is subject by law to a transparent mechanism for the resolution of legal disputes which is considered to be effective in dealing with most issues and that is appropriate to the context of the UoA.	The management system incorporates or is subject by law to a transparent mechanism for the resolution of legal disputes that is appropriate to the context of the fishery and has been tested and proven to be effective .
Met?	(Y/N)	YES, the legal systems are in place from BMU, co-mgt, Fisheries Act etc. but some flaws exist in the implementation etc.	(Y/N)
c	Respect for rights		
Guidepost	The management system has a mechanism to generally respect the legal rights created explicitly or established by custom of people dependent on fishing for food or livelihood in a manner consistent with the objectives of MSC Principles 1 and 2.	The management system has a mechanism to observe the legal rights created explicitly or established by custom of people dependent on fishing for food or livelihood in a manner consistent with the objectives of MSC Principles 1 and 2.	The management system has a mechanism to formally commit to the legal rights created explicitly or established by custom of people dependent on fishing for food and livelihood in a manner consistent with the objectives of MSC Principles 1 and 2.
Met?	(Y/N)	(Y/N)	YES, BMUs regulations show clear mandate to

PI 3.1.1	<p>The management system exists within an appropriate legal and/or customary framework which ensures that it:</p> <ul style="list-style-type: none"> • Is capable of delivering sustainability in the UoA(s); and • Observes the legal rights created explicitly or established by custom of people dependent on fishing for food or livelihood; and • Incorporates an appropriate dispute resolution framework. 		
			commit legal rights to resource users etc.
Overall PI justification	<p>Fisheries law in place, BMU regulations, ICZM framework, Kenya constitution of Kenya 2010; Wildlife Act, EMCA etc. The legal systems are in place from BMU, co-mgt, Fisheries Act etc. but some flaws exist in the implementation etc. BMUs regulations show clear mandate to commit legal rights to resource users etc.</p>		
References	<p>BMU regulations 2007; AMCA 1999; Fisheries Development and Management Act 2016; ICZM policy</p>		
		Likely PI Scoring Level (<60, 60-79, ≥ 80)	≥ 80

Evaluation Table for PI 3.1.2 – Consultation, roles and responsibilities

PI 3.1.2	<p>The management system has effective consultation processes that are open to interested and affected parties. The roles and responsibilities of Organizations and individuals who are involved in the management process are clear and understood by all relevant parties</p>		
Scoring Issue	SG 60	SG 80	SG 100
a	Roles and responsibilities		
Guidepost	Organizations and individuals involved in the management process have been identified. Functions, roles and responsibilities are generally understood .	Organizations and individuals involved in the management process have been identified. Functions, roles and responsibilities are explicitly defined and well understood for key areas of responsibility and interaction.	Organizations and individuals involved in the management process have been identified. Functions, roles and responsibilities are explicitly defined and well understood for all areas of responsibility and interaction.
Met?	(Y/N)	YES, Generally explicitly defined & well understood for key areas of responsibility & interaction but overlaps exist in the legal framework e.g. Wildlife Act for ETPs, EMCA for environmental issues etc	(Y/N)
b	Consultation processes		
Guidepost	The management system includes consultation processes that obtain relevant information from the main affected parties, including local knowledge, to inform the management system.	The management system includes consultation processes that regularly seek and accept relevant information, including local knowledge. The management system demonstrates consideration of the information obtained.	The management system includes consultation processes that regularly seek and accept relevant information, including local knowledge. The management system demonstrates consideration of the information and explains how it is used or not used .

PI 3.1.2		The management system has effective consultation processes that are open to interested and affected parties. The roles and responsibilities of Organizations and individuals who are involved in the management process are clear and understood by all relevant parties		
	Met?	(Y/N)	YES, Consultation processes are in place but not regular based on time frames, to inform management system	(Y/N)
c	Participation			
	Guidepost		The consultation process provides opportunity for all interested and affected parties to be involved.	The consultation process provides opportunity and encouragement for all interested and affected parties to be involved, and facilitates their effective engagement.
	Met?		(Y/N)	YES, Consultations are encouraged, opportunities provided, and facilitation for BMUs, Stakeholders etc. given wherever opportunity arises
Overall PI justification		Generally explicitly defined & well understood for key areas of responsibility & interaction but overlaps exist in the legal framework e.g. Wildlife Act for ETPs, EMCA for environmental issues etc Consultation processes are in place but not regular based on time frames, to inform management system Consultations are encouraged, opportunities provided, and facilitation for BMUs, Stakeholders etc. given wherever opportunity arises		
References		BMU regulations 2007; Fisheries Development and Management Act 2016		
			Likely PI Scoring Level (<60, 60-79, ≥ 80)	≥ 80

Evaluation Table for PI 3.1.3 – Long term objectives

PI 3.1.3		The management policy has clear long-term objectives to guide decision-making that are consistent with MSC fisheries standard, and incorporates the precautionary approach.		
Scoring Issue		SG 60	SG 80	SG 100
a	Objectives			
	Guidepost	Long-term objectives to guide decision-making, consistent with the MSC fisheries standard and the precautionary approach, are implicit within management policy.	Clear long-term objectives that guide decision-making, consistent with MSC fisheries standard and the precautionary approach are explicit within management policy.	Clear long-term objectives that guide decision-making, consistent with MSC fisheries standard and the precautionary approach, are explicit within and required by management policy.
	Met?	(Y/N/Partial)	(Y/N/Partial)	YES, Fisheries Act: calls for EAF approach to management at no less standards than defined in international agreements; IOTC, UNCLOS, IPOAs etc.
Overall PI justification		Fisheries Act: calls for EAF approach to management at no less standards than defined in international agreements; IOTC, UNCLOS, IPOAs etc.		

PI 3.1.3	The management policy has clear long-term objectives to guide decision-making that are consistent with MSC fisheries standard, and incorporates the precautionary approach.		
References	Fisheries Development and Management Act 2016		
	Likely PI Scoring Level (<60, 60-79, ≥ 80)		≥ 80

Evaluation Table for PI 3.2.1 Fishery-specific objectives

PI 3.2.1	The fishery-specific management system has clear, specific objectives designed to achieve the outcomes expressed by MSC's Principles 1 and 2.		
Scoring Issue	SG 60	SG 80	SG 100
a	Objectives		
	Guidepost	Short and long-term objectives , which are consistent with achieving the outcomes expressed by MSC's Principles 1 and 2, are explicit within the fishery-specific management system.	Well defined and measurable short and long-term objectives , which are demonstrably consistent with achieving the outcomes expressed by MSC's Principles 1 and 2, are explicit within the fishery-specific management system.
	Met?	Partial, no fishery specific objectives outlined; no management plan existing etc.	(Y/N/Partial)
Overall PI justification	no fishery specific objectives outlined; no management plan existing etc.		
References	Not available		
	Likely PI Scoring Level (<60, 60-79, ≥ 80)		<60

Evaluation Table for PI 3.2.2 – Decision-making processes

PI 3.2.2	The fishery-specific management system includes effective decision-making processes that result in measures and strategies to achieve the objectives, and has an appropriate approach to actual disputes in the fishery.		
Scoring Issue	SG 60	SG 80	SG 100
a	Decision-making processes		
	Guidepost	There are established decision-making processes that result in measures and strategies to achieve the fishery-specific objectives.	
	Met?	YES, BMU regulations and decision making structures, the EAF approach which has been streamlined and incorporated in management	(Y/N)
b	Responsiveness of decision-making processes		

PI 3.2.2		The fishery-specific management system includes effective decision-making processes that result in measures and strategies to achieve the objectives, and has an appropriate approach to actual disputes in the fishery.		
	Guidepost	Decision-making processes respond to serious issues identified in relevant research, monitoring, evaluation and consultation, in a transparent, timely and adaptive manner and take some account of the wider implications of decisions.	Decision-making processes respond to serious and other important issues identified in relevant research, monitoring, evaluation and consultation, in a transparent, timely and adaptive manner and take account of the wider implications of decisions.	Decision-making processes respond to all issues identified in relevant research, monitoring, evaluation and consultation, in a transparent, timely and adaptive manner and take account of the wider implications of decisions.
	Met?	YES, but responds only to serious issues esp. with regards to fisheries, ecosystems, governance etc.	(Y/N)	(Y/N)
c	Use of precautionary approach			
	Guidepost		Decision-making processes use the precautionary approach and are based on best available information.	
	Met?		Yes, EAF approach well streamlined and incorporated in management	
d	Accountability and transparency of management system and decision-making process			
	Guidepost	Some information on the fishery's performance and management action is generally available on request to stakeholders.	Information on the fishery's performance and management action is available on request , and explanations are provided for any actions or lack of action associated with findings and relevant recommendations emerging from research, monitoring, evaluation and review activity.	Formal reporting to all interested stakeholders provides comprehensive information on the fishery's performance and management actions and describes how the management system responded to findings and relevant recommendations emerging from research, monitoring, evaluation and review activity.
	Met?	YES, information on the fishery's performance & management action is available on request, with recommendations from research, M&E etc.	(Y/N)	(Y/N)
e	Approach to disputes			
	Guidepost	Although the management authority or fishery may be subject to continuing court challenges, it is	The management system or fishery is attempting to comply in a timely fashion with judicial decisions	The management system or fishery acts proactively to avoid legal disputes or rapidly implements

PI 3.2.2	The fishery-specific management system includes effective decision-making processes that result in measures and strategies to achieve the objectives, and has an appropriate approach to actual disputes in the fishery.		
	not indicating a disrespect or defiance of the law by repeatedly violating the same law or regulation necessary for the sustainability for the fishery.	arising from any legal challenges.	judicial decisions arising from legal challenges.
Met?	YES, effort has been put into dispute resolution, attempts to comply are visible by the management	(Y/N)	(Y/N)
Overall PI justification	BMU regulations and decision making structures, the EAF approach which has been streamlined and incorporated in management Decision making processes available but responds only to serious issues esp. with regards to fisheries, ecosystems, governance etc. EAF approach well streamlined and incorporated in management Information on the fishery's performance & management action is available on request, with recommendations from research, M&E etc. effort has been put into dispute resolution, attempts to comply are visible by the management		
References	BMU regulation 2007 and Fisheries Development and Management Act 2016		
		Likely PI Scoring Level (<60, 60-79, ≥ 80)	60-79

Evaluation Table for PI 3.2.3 – Compliance and enforcement

PI 3.2.3	Monitoring, control and surveillance mechanisms ensure the management measures in the fishery are enforced and complied with.		
Scoring Issue	SG 60	SG 80	SG 100
a	MCS implementation		
Guidepost	Monitoring, control and surveillance mechanisms exist, and are implemented in the fishery and there is a reasonable expectation that they are effective.	A monitoring, control and surveillance system has been implemented in the fishery and has demonstrated an ability to enforce relevant management measures, strategies and/or rules.	A comprehensive monitoring, control and surveillance system has been implemented in the fishery and has demonstrated a consistent ability to enforce relevant management measures, strategies and/or rules.
Met?	YES. for the general fishery but none specific to octopus	(Y/N)	(Y/N)
b	Sanctions		
Guidepost	Sanctions to deal with non-compliance exist and there is some evidence that they are applied.	Sanctions to deal with non-compliance exist, are consistently applied and thought to provide effective deterrence.	Sanctions to deal with non-compliance exist, are consistently applied and demonstrably provide effective deterrence.
Met?	YES, General sanctions exist in Fisheries Act, BMU by laws, not specific to Octopus	(Y/N)	(Y/N)

PI 3.2.3	Monitoring, control and surveillance mechanisms ensure the management measures in the fishery are enforced and complied with.		
	fisheries, the regulations are clear, but enforcement is still weak with little evidence available for sanctions etc		
c	Compliance		
	Guidepost	Fishers are generally thought to comply with the management system for the fishery under assessment, including, when required, providing information of importance to the effective management of the fishery.	Some evidence exists to demonstrate fishers comply with the management system under assessment, including, when required, providing information of importance to the effective management of the fishery.
Met?	YES, generally thought to comply, but no evidence exists to show compliance, information provision etc., hence there is need to develop a comprehensive MCS system	(Y/N)	(Y/N)
d	Systematic non-compliance		
	Guidepost		There is no evidence of systematic non-compliance.
Met?		YES, there is no evidence of non-compliance, and generally, the fishers comply with legislation, licensing etc.	
Overall PI justification	MCS mechanisms available for the general fishery but none specific to octopus General sanctions exist in Fisheries Act, BMU by laws, not specific to Octopus fisheries, the regulations are clear, but enforcement is still weak with little evidence available for sanctions etc Generally thought to comply, but no evidence exists to show compliance, information provision etc., hence there is need to develop a comprehensive MCS system There is no evidence of non-compliance, and generally, the fishers comply with legislation, licensing etc.		
References	Fisheries Development and Management Act 2016; Stakeholder consultation minutes		
Likely PI Scoring Level (<60, 60-79, ≥ 80)		60-79	

Evaluation Table for PI 3.2.4 – Monitoring and management performance evaluation

PI 3.2.4	There is a system of monitoring and evaluating the performance of the fishery-specific management system against its objectives. There is effective and timely review of the fishery-specific management system.		
Scoring Issue	SG 60	SG 80	SG 100
a	Evaluation coverage		
Guidepost	There are mechanisms in place to evaluate some parts of the fishery-specific management system.	There are mechanisms in place to evaluate key parts of the fishery-specific management system	There are mechanisms in place to evaluate all parts of the fishery-specific management system.
Met?	NO, and some aspects need redress e.g. by-catch, conflicts with other fisheries, effort etc.	(Y/N)	(Y/N)
b	Internal and/or external review		
Guidepost	The fishery-specific management system is subject to occasional internal review.	The fishery-specific management system is subject to regular internal and occasional external review.	The fishery-specific management system is subject to regular internal and external review.
Met?	NO, but some occasional assessments done, esp. with ref to research and conflicts resolution with other fisheries	(Y/N)	(Y/N)
Overall PI justification	No mechanisms in place specific to the fishery Some aspects need redress e.g. by-catch, conflicts with other fisheries, effort etc. some occasional assessments done, esp. with ref to research and conflicts resolution with other fisheries		
References	Frame surveys		
		Likely PI Scoring Level (<60, 60-79, ≥ 80)	<60

Appendix 10: MSC's BMT Baseline Status & 5-year projections for Octopus Fishery

Principle	Component	Performance Indicator	Actual 2019	Expected 2020	Expected 2021	Expected 2022	Expected 2023
1	Outcome	1.1.1 Stock status	<60	<60	60-79	60-79	60-79
		1.1.2 Stock rebuilding	---	---	---	---	---
	Management	1.2.1 Harvest Strategy	<60	<60	<60	<60	60-79
		1.2.2 Harvest control rules and	<60	<60	<60	<60	60-79
		1.2.3 Information and monitoring	<60	60-79	60-79	60-79	≥80
		1.2.4 Assessment of stock status	<60	60-79	60-79	60-79	≥80
2	Primary species	2.1.1 Outcome	<60	<60	<60	60-79	60-79
		2.1.2 Management	<60	<60	<60	<60	60-79
		2.1.3 Information	<60	<60	60-79	60-79	≥80
	Secondary species	2.2.1 Outcome	---	---	---	---	---
		2.2.2 Management	---	---	---	---	---
		2.2.3 Information	---	---	---	---	---
	ETP species	2.3.1 Outcome	60-79	60-79	60-79	60-79	≥80
		2.3.2 Management	---	---	---	---	---
		2.3.3 Information	60-79	60-79	60-79	≥80	≥80
	Habitats	2.4.1 Outcome	<60	<60	<60	60-79	60-79
		2.4.2 Management	60-79	60-79	60-79	60-79	≥80
		2.4.3 Information	60-79	60-79	≥80	≥80	≥80
	Ecosystem	2.5.1 Outcome	60-79	60-79	60-79	60-79	≥80
		2.5.2 Management	60-79	60-79	60-79	60-79	≥80
		2.5.3 Information	60-79	60-79	≥80	≥80	≥80
3	Governance and Policy	3.1.1 Legal and customary	≥80	≥80	≥80	≥80	≥80
		3.1.2 Consultation, roles and responsibilities	≥80	≥80	≥80	≥80	≥80
		3.1.3 Long term objectives	≥80	≥80	≥80	≥80	≥80
	Fishery specific management system	3.2.1 Fishery specific objectives	<60	<60	60-79	60-79	≥80
		3.2.2 Decision making processes	60-79	60-79	≥80	≥80	≥80
		3.2.3 Compliance and enforcement	60-79	60-79	60-79	≥80	≥80
		3.2.4 Management performance evaluation	<60	<60	<60	60-79	60-79
Total number of PIs equal to or greater than 80			3	3	6	8	16
Total number of PIs 60-79			9	11	11	12	7
Total number of PIs less than 60			11	9	6	3	0
Overall BMT Index			0.33	0.37	0.50	0.61	0.85

Appendix 11: MSC Pre-assessment Results for North-Kenya Bank (NKB) Snapper Fishery

Principle 1 Sustainability of exploited fish stocks

Evaluation Table for PI 1.1.1 – Stock status

PI 1.1.1	The stock is at a level which maintains high productivity and has a low probability of recruitment overfishing		
Scoring Issue	SG 60	SG 80	SG 100
a	Stock status relative to recruitment impairment		
Guidepost	It is likely that the stock is above the point where recruitment would be impaired (PRI).	It is highly likely that the stock is above the PRI.	There is a high degree of certainty that the stock is above the PRI.
Met?	YES, however stock assessments needs to be conducted to supplement the gear trials conducted under the KCDP Dropline fisheries	(Y/N)	(Y/N)
b	Stock status in relation to achievement of MSY		
Guidepost		The stock is at or fluctuating around a level consistent with MSY.	There is a high degree of certainty that the stock has been fluctuating around a level consistent with MSY or has been above this level over recent years.
Met?		NO, no stock assessment conducted hence need to assess the stocks and set reference points; MSY, F_{MSY} etc.	(Y/N)
Overall PI justification	Stock assessments needs to be conducted to supplement the gear trials conducted under the KCDP Drop line fisheries No stock assessment conducted hence need to assess the stocks and set reference points; MSY, F_{MSY} etc.		
References	[List any references here]		
RBF Required? (✓/✗/)	✓ RBF Required	Likely PI Scoring Level (<60, 60-79, ≥ 80)	<60
Stock Status relative to Reference Points			
	Type of reference point	Value of reference point	Current stock status relative to reference point
Reference point used in scoring stock relative to PRI (SIa)	[e.g. B_{LOSS}]	[Include value specifying units. e.g. 50,000t total stock biomass]	[Include current stock status in the same units as the reference point e.g. $90,000/B_{LOSS}=1.8$]
Reference point used in scoring stock relative to MSY (SIb)	[e.g. B_{MSY}]	[Include value specifying units. e.g. 100,000t total stock biomass]	[Include current stock status in the same units as the reference point e.g. $90,000/B_{MSY}=0.9$]

Evaluation Table for PI 1.1.1A - key LTL [NOTE: only use this table for stocks identified as key LTL]

PI 1.1.1 A	The stock is at a level which has a low probability of serious ecosystem impacts		
Scoring Issue	SG 60	SG 80	SG 100
a	Stock status relative to ecosystem impairment		
Guidepost	It is likely that the stock is above the point where serious ecosystem impacts could occur.	It is highly likely that the stock is above the point where serious ecosystem impacts could occur.	There is a high degree of certainty that the stock is above the point where serious ecosystem impacts could occur.
Met?	(Y/N)	(Y/N)	(Y/N)
b	Stock status in relation to ecosystem needs		
Guidepost		The stock is at or fluctuating around a level consistent with ecosystem needs.	There is a high degree of certainty that the stock has been fluctuating around a level consistent with ecosystem needs or has been above this level over recent years.
Met?		(Y/N)	(Y/N)
Overall PI justification	Non LTL species hence no scores		
References	[List any references here]		
RBF Required? (✓/✗/)	X	Likely PI Scoring Level (<60, 60-79, ≥ 80)	NO SCORE
Stock Status relative to Reference Points			
	Type of reference point	Value of reference point	Current stock status relative to reference point
Reference point used in scoring stock relative to ecosystem impairment (SIa)	[e.g. B _{35%}]	[Include value specifying units. e.g. 50,000t total stock biomass]	[Include current stock status in the same units as the reference point e.g. 90,000/B _{35%} =1.8]
Reference point used in scoring stock relative to ecosystem needs (SIb)	[e.g. B _{75%}]	[Include value specifying units. e.g. 100,000t total stock biomass]	[Include current stock status in the same units as the reference point e.g. 90,000/B _{75%} =0.9]

valuation Table for PI 1.1.2 – Stock rebuilding

PI 1.1.2	Where the stock is reduced, there is evidence of stock rebuilding within a specified timeframe			
Scoring Issue	SG 60	SG 80	SG 100	
a	Rebuilding timeframes			
	Guidepost	A rebuilding timeframe is specified for the stock that is the shorter of 20 years or 2 times its generation time . For cases where 2 generations is less than 5 years, the rebuilding timeframe is up to 5 years.		The shortest practicable rebuilding timeframe is specified which does not exceed one generation time for the stock.
	Met?	NO, data scanty, no stock assessment conducted, no frameworks set		(Y/N)
b	Rebuilding evaluation			
	Guidepost	Monitoring is in place to determine whether the rebuilding strategies are effective in rebuilding the stock within the specified timeframe.	There is evidence that the rebuilding strategies are rebuilding stocks, or it is likely based on simulation modeling, exploitation rates or previous performance that they will be able to rebuild the stock within the specified timeframe.	There is strong evidence that the rebuilding strategies are rebuilding stocks, or it is highly likely based on simulation modeling, exploitation rates or previous performance that they will be able to rebuild the stock within the specified timeframe.
	Met?	NO, data scanty, no stock assessment conducted, no monitoring	(Y/N)	(Y/N)
Overall PI justification	data scanty, no stock assessment conducted, no frameworks set data scanty, no stock assessment conducted, no monitoring			
References	Not available			
		Likely PI Scoring Level (<60, 60-79, ≥ 80)	NO SCORES	

Evaluation Table for PI 1.2.1 – Harvest strategy

PI 1.2.1		There is a robust and precautionary harvest strategy in place		
Scoring Issue		SG 60	SG 80	SG 100
a	Harvest strategy design			
	Guidepost	The harvest strategy is expected to achieve stock management objectives reflected in PI 1.1.1 SG80.	The harvest strategy is responsive to the state of the stock and the elements of the harvest strategy work together towards achieving stock management objectives reflected in PI 1.1.1 SG80.	The harvest strategy is responsive to the state of the stock and is designed to achieve stock management objectives reflected in PI 1.1.1 SG80.
	Met?	NO, no harvest strategy in place for the fishery	(Y/N)	(Y/N)
b	Harvest strategy evaluation			
	Guidepost	The harvest strategy is likely to work based on prior experience or plausible argument.	The harvest strategy may not have been fully tested but evidence exists that it is achieving its objectives.	The performance of the harvest strategy has been fully evaluated and evidence exists to show that it is achieving its objectives including being clearly able to maintain stocks at target levels.
	Met?	NO, no harvest strategy in place for the fishery, no evaluation	(Y/N)	(Y/N)
c	Harvest strategy monitoring			
	Guidepost	Monitoring is in place that is expected to determine whether the harvest strategy is working.		
	Met?	NO, no harvest strategy in place for the fishery, no monitoring		
d	Harvest strategy review			
	Guidepost			The harvest strategy is periodically reviewed and improved as necessary.
	Met?			NO, no harvest strategy in place for the fishery, no review
e	Shark finning			
	Guidepost	It is likely that shark finning is not taking place.	It is highly likely that shark finning is not taking place.	There is a high degree of certainty that shark finning is not taking place.
	Met?	Not relevant	(Y/N/Not relevant)	(Y/N/Not relevant)
f	Review of alternative measures			
	Guidepost	There has been a review of the potential effectiveness and practicality of	There is a regular review of the potential effectiveness and practicality of	There is a biennial review of the potential effectiveness and practicality of alternative

PI 1.2.1		There is a robust and precautionary harvest strategy in place		
		alternative measures to minimize UoA-related mortality of unwanted catch of the target stock.	alternative measures to minimize UoA-related mortality of unwanted catch of the target stock and they are implemented as appropriate.	measures to minimize UoA-related mortality of unwanted catch of the target stock, and they are implemented, as appropriate.
	Met?	Not relevant	(Y/N/Not relevant)	(Y/N/Not relevant)
Overall PI justification		no harvest strategy in place for the fishery no harvest strategy in place for the fishery, no evaluation no harvest strategy in place for the fishery, no monitoring no harvest strategy in place for the fishery, no review No shark fining associated with the fishery		
References		Not available		
			Likely PI Scoring Level (<60, 60-79, ≥ 80)	<60

Evaluation Table for PI 1.2.2 – Harvest control rules and tools

PI 1.2.2		There are well defined and effective harvest control rules (HCRs) in place		
Scoring Issue		SG 60	SG 80	SG 100
a	HCRs design and application			
	Guidepost	Generally understood HCRs are in place or available that are expected to reduce the exploitation rate as the point of recruitment impairment (PRI) is approached.	Well defined HCRs are in place that ensure that the exploitation rate is reduced as the PRI is approached, are expected to keep the stock fluctuating around a target level consistent with (or above) MSY, or for key LTL species a level consistent with ecosystem needs.	The HCRs are expected to keep the stock fluctuating at or above a target level consistent with MSY, or another more appropriate level taking into account the ecological role of the stock, most of the time.
	Met?	NO, little information available on fishery, no rules set in place for the fishery; fairly new fishery	(Y/N)	
b	HCRs robustness to uncertainty			
	Guidepost		The HCRs are likely to be robust to the main uncertainties.	The HCRs take account of a wide range of uncertainties including the ecological role of the stock, and there is evidence that the HCRs are robust to the main uncertainties.
	Met?		NO, little information available on fishery, no HCRs set, robustness not evaluated against main uncertainties	(Y/N)
c	HCRs evaluation			

PI 1.2.2		There are well defined and effective harvest control rules (HCRs) in place		
	Guidepost	There is some evidence that tools used or available to implement HCRs are appropriate and effective in controlling exploitation.	Available evidence indicates that the tools in use are appropriate and effective in achieving the exploitation levels required under the HCRs.	Evidence clearly shows that the tools in use are effective in achieving the exploitation levels required under the HCRs.
	Met?	NO, little information available on fishery, no tolls set for the HCRs implementation, effectiveness not tested	(Y/N)	(Y/N)
Overall PI justification		Fishery is fairly new hence no management plan, no HCRs set yet, robustness of any harvest control rules hasn't been evaluated, effectiveness of any rules not tested little information available on fishery, no rules set in place for the fishery; fairly new fishery little information available on fishery, no HCRs set, robustness not evaluated against main uncertainties little information available on fishery, no tolls set for the HCRs implementation, effectiveness not tested		
References		Not available		
			Likely PI Scoring Level (<60, 60-79, ≥ 80)	<60

Evaluation Table for PI 1.2.3 – Information and monitoring

PI 1.2.3		Relevant information is collected to support the harvest strategy		
Scoring Issue		SG 60	SG 80	SG 100
a	Range of information			
	Guidepost	Some relevant information related to stock structure, stock productivity and fleet composition is available to support the harvest strategy.	Sufficient relevant information related to stock structure, stock productivity, fleet composition and other data is available to support the harvest strategy.	A comprehensive range of information (on stock structure, stock productivity, fleet composition, stock abundance, UoA removals and other information such as environmental information), including some that may not be directly related to the current harvest strategy, is available.
	Met?	NO, information on stocks, productivity, fleet composition etc. is lacking; none to support a defined harvest strategy	(Y/N)	(Y/N)
b	Monitoring			
	Guide post	Stock abundance and UoA removals are monitored and at least one indicator is available and monitored with sufficient frequency to	Stock abundance and UoA removals are regularly monitored at a level of accuracy and coverage consistent with the harvest control rule , and one or more indicators are available and monitored	All information required by the harvest control rule is monitored with high frequency and a high degree of certainty, and there is a good understanding of inherent uncertainties in the

PI 1.2.3		Relevant information is collected to support the harvest strategy		
		support the harvest control rule.	with sufficient frequency to support the harvest control rule.	information [data] and the robustness of assessment and management to this uncertainty.
	Met?	NO, Stock abundance & UoA removals are not monitored; indicators are available for the fishery	(Y/N)	(Y/N)
c	Comprehensiveness of information			
	Guidepost		There is good information on all other fishery removals from the stock.	
	Met?		NO, information on all fishery removals from the fishery is clearly lacking; need for extensive stock assessments	
Overall PI justification		Information on stocks, productivity, fleet composition etc. is lacking; none to support a defined harvest strategy Stock abundance & UoA removals are not monitored; indicators are available for the fishery Information on all fishery removals from the fishery is clearly lacking; need for extensive stock assessments		
References		No solid references available		
			Likely PI Scoring Level (<60, 60-79, ≥ 80)	<60,

Evaluation Table for PI 1.2.4 – Assessment of stock status

PI 1.2.4		There is an adequate assessment of the stock status		
Scoring Issue		SG 60	SG 80	SG 100
a	Appropriateness of assessment to stock under consideration			
	Guidepost		The assessment is appropriate for the stock and for the harvest control rule.	The assessment takes into account the major features relevant to the biology of the species and the nature of the UoA.
	Met?		NO, there are no stock assessments conducted on the fishery	(Y/N)
b	Assessment approach			
	Guidepost	The assessment estimates stock status relative to generic reference points appropriate to the species category.	The assessment estimates stock status relative to reference points that are appropriate to the stock and can be estimated.	
	Met?	NO, there are no stock assessments conducted on the fishery	(Y/N)	
c	Uncertainty in the assessment			

PI 1.2.4		There is an adequate assessment of the stock status		
	Guidepost	The assessment identifies major sources of uncertainty.	The assessment takes uncertainty into account.	The assessment takes into account uncertainty and is evaluating stock status relative to reference points in a probabilistic way.
	Met?	NO, there are no stock assessments conducted on the fishery	(Y/N)	(Y/N)
d	Evaluation of assessment			
	Guidepost			The assessment has been tested and shown to be robust. Alternative hypotheses and assessment approaches have been rigorously explored.
	Met?			NO, there are no stock assessments conducted on the fishery; robustness
e	Peer review of assessment			
	Guidepost		The assessment of stock status is subject to peer review.	The assessment has been internally and externally peer reviewed.
	Met?		NO, assessments done, no reviews conducted	(Y/N)
Overall PI justification		No stock assessments, no evaluations, no strategies, little data and information available, need for extensive evaluations required with establishment of HCRs and harvest strategies		
References		Unavailable		
			Likely PI Scoring Level (<60, 60-79, ≥ 80)	<60

Principle 2 Maintenance of the fishery ecosystem

Evaluation Table for PI 2.1.1 – Primary species outcome

PI 2.1.1		The UoA aims to maintain primary species above the PRI and does not hinder recovery of primary species if they are below the PRI.		
Scoring Issue		SG 60	SG 80	SG 100
a	Main primary species stock status			
	Guidepost	Main primary species are likely to be above the PRI OR If the species is below the PRI, the UoA has measures in place that are expected to ensure that the UoA does not hinder recovery and rebuilding.	Main primary species are highly likely to be above the PRI OR If the species is below the PRI, there is either evidence of recovery or a demonstrably effective strategy in place between all MSC UoAs which categorize this species as main , to ensure that they collectively do not hinder recovery and rebuilding.	There is a high degree of certainty that main primary species are above the PRI and are fluctuating around a level consistent with MSY.
	Met?	NO, there are no stock assessments conducted on the fishery; no data	(Y/N)	(Y/N)

PI 2.1.1	The UoA aims to maintain primary species above the PRI and does not hinder recovery of primary species if they are below the PRI.		
	& information on stock status		
b	Minor primary species stock status		
	Guidepost		Minor primary species are highly likely to be above the PRI OR If below the PRI, there is evidence that the UoA does not hinder the recovery and rebuilding of minor primary species
	Met?		NO, there are no stock assessments conducted on the fishery; no data & information on stock status
Overall PI justification	No stock assessments, no evaluations, no strategies, little data and information available, need for extensive evaluations required with establishment of HCRs and harvest strategies		
References	Not available		
RBF Required? (✓/✗/)	X	Likely PI Scoring Level (<60, 60-79, ≥ 80)	<60

Evaluation Table for PI 2.1.2 – Primary species management strategy

PI 2.1.2	There is a strategy in place that is designed to maintain or to not hinder rebuilding of primary species, and the UoA regularly reviews and implements measures, as appropriate, to minimize the mortality of unwanted catch.			
Scoring Issue	SG 60	SG 80	SG 100	
a	Management strategy in place			
	Guidepost	There are measures in place for the UoA, if necessary, that are expected to maintain or to not hinder rebuilding of the main primary species at/to levels which are likely to above the point where recruitment would be impaired.	There is a partial strategy in place for the UoA, if necessary, that is expected to maintain or to not hinder rebuilding of the main primary species at/to levels which are highly likely to be above the point where recruitment would be impaired.	There is a strategy in place for the UoA for managing main and minor primary species.
	Met?	NO, there are no stock assessments conducted on the fishery; no data & information on stock status; no measures in place	(Y/N)	(Y/N)
b	Management strategy evaluation			
	Guidepost	The measures are considered likely to work, based on plausible argument (e.g., general experience, theory or comparison with	There is some objective basis for confidence that the measures/partial strategy will work, based on some information directly about the fishery and/or species involved.	Testing supports high confidence that the partial strategy/strategy will work, based on information directly about the fishery and/or species involved.

PI 2.1.2	There is a strategy in place that is designed to maintain or to not hinder rebuilding of primary species, and the UoA regularly reviews and implements measures, as appropriate, to minimize the mortality of unwanted catch.		
		similar fisheries/species).	
	Met?	NO, there are no stock assessments conducted on the fishery; no data & information on stock status; no measures tested	(Y/N)
			(Y/N)
c	Management strategy implementation		
	Guidepost		There is some evidence that the measures/partial strategy is being implemented successfully .
			There is clear evidence that the partial strategy/strategy is being implemented successfully and is achieving its overall objective as set out in scoring issue (a).
	Met?		NO, there are measures/strategy in place; no evaluation of successful implementation
			(Y/N)
d	Shark finning		
	Guidepost	It is likely that shark finning is not taking place.	It is highly likely that shark finning is not taking place.
			There is a high degree of certainty that shark finning is not taking place.
	Met?	NO, no data on shark finning from fishery evident	(Y/N/Not relevant)
			(Y/N/Not relevant)
e	Review of alternative measures		
	Guidepost	There is a review of the potential effectiveness and practicality of alternative measures to minimize UoA-related mortality of unwanted catch of main primary species.	There is a regular review of the potential effectiveness and practicality of alternative measures to minimize UoA-related mortality of unwanted catch of main primary species and they are implemented as appropriate.
			There is a biennial review of the potential effectiveness and practicality of alternative measures to minimize UoA-related mortality of unwanted catch of all primary species, and they are implemented, as appropriate.
	Met?	NO, alternative measures for the fishery	(Y/N/Not relevant)
			(Y/N/Not relevant)
Overall PI justification	There are no stock assessments conducted on the fishery; no data & information on stock status; no measures in place There are no stock assessments conducted on the fishery; no data & information on stock status; no measures tested There are measures/strategy in place; no evaluation of successful implementation No data on shark finning from fishery evident alternative measures for the fishery		
References	Not available		
	Likely PI Scoring Level (<60, 60-79, ≥ 80)		<60

Evaluation Table for PI 2.1.3 – Primary species information

PI 2.1.3	Information on the nature and extent of primary species is adequate to determine the risk posed by the UoA and the effectiveness of the strategy to manage primary species		
Scoring Issue	SG 60	SG 80	SG 100
a	Information adequacy for assessment of impact on main primary species		
Guidepost	Qualitative information is adequate to estimate the impact of the UoA on the main primary species with respect to status. OR If RBF is used to score PI 2.1.1 for the UoA: Qualitative information is adequate to estimate productivity and susceptibility attributes for main primary species.	Some quantitative information is available and is adequate to assess the impact of the UoA on the main primary species with respect to status. OR If RBF is used to score PI 2.1.1 for the UoA: Some quantitative information is adequate to assess productivity and susceptibility attributes for main primary species.	Quantitative information is available and is adequate to assess with a high degree of certainty the impact of the UoA on main primary species with respect to status.
Met?	NO, information fishery impacts on primary species lacking	(Y/N)	(Y/N)
b	Information adequacy for assessment of impact on minor primary species		
Guidepost			Some quantitative information is adequate to estimate the impact of the UoA on minor primary species with respect to status.
Met?			No information
c	Information adequacy for management strategy		
Guidepost	Information is adequate to support measures to manage main primary species.	Information is adequate to support a partial strategy to manage main Primary species.	Information is adequate to support a strategy to manage all primary species, and evaluate with a high degree of certainty whether the strategy is achieving its objective.
Met?	NO, adequate info to support strategy lacking	(Y/N)	(Y/N)
Overall PI justification	Extensive stock assessment needed for all species, to supplement the trials data on drop line etc. under KCDP; Recommend RBF analysis information fishery impacts on primary species lacking No adequate information to support strategy lacking		
References	Not available		
		Likely PI Scoring Level (<60, 60-79, ≥ 80)	<60

Evaluation Table for PI 2.2.1 – Secondary species outcome

PI 2.2.1	The UoA aims to maintain secondary species above a biologically based limit and does not hinder recovery of secondary species if they are below a biological based limit.			
Scoring Issue	SG 60	SG 80	SG 100	
a	Main secondary species stock status			
	Guidepost	Main Secondary species are likely to be within biologically based limits. OR If below biologically based limits, there are measures in place expected to ensure that the UoA does not hinder recovery and rebuilding.	Main secondary species are highly likely to be above biologically based limits OR If below biologically based limits, there is either evidence of recovery or a demonstrably effective partial strategy in place such that the UoA does not hinder recovery and rebuilding. AND Where catches of a main secondary species outside of biological limits are considerable, there is either evidence of recovery or a, demonstrably effective strategy in place between those MSC UoAs that also have considerable catches of the species, to ensure that they collectively do not hinder recovery and rebuilding.	There is a high degree of certainty that main secondary species are within biologically based limits.
	Met?	NO, adequate information lacking	(Y/N)	(Y/N)
b	Minor secondary species stock status			
	Guidepost			Minor secondary species are highly likely to be above biologically based limits. OR If below biologically based limits', there is evidence that the UoA does not hinder the recovery and rebuilding of secondary species
	Met?			NO, adequate info to support strategy lacking
Overall PI justification	Extensive stock assessment and catch-effort monitoring needed Information is evidently lacking			
References	Not available			
RBF Required? (✓/×/)	✓ RBF Required	Likely PI Scoring Level (<60, 60-79, ≥ 80)	<60	

Evaluation Table for PI 2.2.2 – Secondary species management strategy

PI 2.2.2	There is a strategy in place for managing secondary species that is designed to maintain or to not hinder rebuilding of secondary species and the UoA regularly reviews and implements measures, as appropriate, to minimize the mortality of unwanted catch.		
Scoring Issue	SG 60	SG 80	SG 100
a	Management strategy in place		
Guidepost	There are measures in place, if necessary, which are expected to maintain or not hinder rebuilding of main secondary species at/to levels which are highly likely to be within biologically based limits or to ensure that the UoA does not hinder their recovery.	There is a partial strategy in place, if necessary, for the UoA that is expected to maintain or not hinder rebuilding of main secondary species at/to levels which are highly likely to be within biologically based limits or to ensure that the UoA does not hinder their recovery.	There is a strategy in place for the UoA for managing main and minor secondary species.
Met?	NO, adequate info lacking, no strategy	(Y/N)	(Y/N)
b	Management strategy evaluation		
Guidepost	The measures are considered likely to work, based on plausible argument (e.g. general experience, theory or comparison with similar UoAs/species).	There is some objective basis for confidence that the measures/partial strategy will work, based on some information directly about the UoA and/or species involved.	Testing supports high confidence that the partial strategy/strategy will work, based on information directly about the UoA and/or species involved.
Met?	NO, adequate info lacking, no strategy, no evaluation	(Y/N)	(Y/N)
c	Management strategy implementation		
Guidepost		There is some evidence that the measures/partial strategy is being implemented successfully .	There is clear evidence that the partial strategy/strategy is being implemented successfully and is achieving its objective as set out in scoring issue (a).
Met?		(Y/N)	(Y/N)
d	Shark finning		
Guidepost	It is likely that shark finning is not taking place.	It is highly likely that shark finning is not taking place.	There is a high degree of certainty that shark finning is not taking place.
Met?	(Y/N/Not relevant)	(Y/N/Not relevant)	(Y/N/Not relevant)
e	Review of alternative measures to minimize mortality of unwanted catch [Scoring issue need not be scored if are no unwanted catches of secondary species]		

PI 2.2.2		There is a strategy in place for managing secondary species that is designed to maintain or to not hinder rebuilding of secondary species and the UoA regularly reviews and implements measures, as appropriate, to minimize the mortality of unwanted catch.		
	Guidepost	There is a review of the potential effectiveness and practicality of alternative measures to minimize UoA-related mortality of unwanted catch of main secondary species.	There is a regular review of the potential effectiveness and practicality of alternative measures to minimize UoA-related mortality of unwanted catch of main secondary species and they are implemented as appropriate.	There is a biennial review of the potential effectiveness and practicality of alternative measures to minimize UoA-related mortality of unwanted catch of all secondary species, and they are implemented, as appropriate.
	Met?	(Y/N/Not relevant)	(Y/N/Not relevant)	(Y/N/Not relevant)
Overall PI justification		Adequate info lacking, no strategy, no evaluation		
References		Not available		
			Likely PI Scoring Level (<60, 60-79, ≥ 80)	<60

Evaluation Table for PI 2.2.3 – Secondary species information

PI 2.2.3		Information on the nature and amount of secondary species taken is adequate to determine the risk posed by the UoA and the effectiveness of the strategy to manage secondary species.		
Scoring Issue		SG 60	SG 80	SG 100
a	Information adequacy for assessment of impacts on main secondary species			
	Guidepost	Qualitative information is adequate to estimate the impact of the UoA on the main secondary species with respect to status. OR If RBF is used to score PI 2.2.1 for the UoA: Qualitative information is adequate to estimate productivity and susceptibility attributes for main secondary species.	Some quantitative information is available and adequate to assess the impact of the UoA on main secondary species with respect to status. OR If RBF is used to score PI 2.2.1 for the UoA: Some quantitative information is adequate to assess productivity and susceptibility attributes for main secondary species.	Quantitative information is available and adequate to assess with a high degree of certainty the impact of the UoA on main secondary species with respect to status.
	Met?	NO, adequate info lacking for stock assesment	(Y/N)	(Y/N)
b	Information adequacy for assessment of impacts on minor secondary species			
	Guidepost			Some quantitative information is adequate to estimate the impact of the UoA on minor secondary species with respect to status.

PI 2.2.3	Information on the nature and amount of secondary species taken is adequate to determine the risk posed by the UoA and the effectiveness of the strategy to manage secondary species.			
	Met?		(Y/N)	
c	Information adequacy for management strategy			
	Guidepost	Information is adequate to support measures to manage main secondary species.	Information is adequate to support a partial strategy to manage main secondary species.	Information is adequate to support a strategy to manage all secondary species, and evaluate with a high degree of certainty whether the strategy is achieving its objective .
	Met?	(Y/N)	(Y/N)	(Y/N)
Overall PI justification	Adequate information lacking for stock assessment			
References	Not available			
		Likely PI Scoring Level (<60, 60-79, ≥ 80)	<60	

Evaluation Table for PI 2.3.1 – ETP species outcome

PI 2.3.1	The UoA meets national and international requirements for the protection of ETP species The UoA does not hinder recovery of ETP species			
Scoring Issue	SG 60	SG 80	SG 100	
a	Effects of the UoA on population/stock within national or international limits, where applicable [Scoring issue need not be scored if there are no national or international requirements that set limits for ETP species].			
	Guidepost	Where national and/or international requirements set limits for ETP species, the effects of the UoA on the population/stock are known and likely to be within these limits.	Where national and/or international requirements set limits for ETP species, the combined effects of the MSC UoAs on the population/stock are known and highly likely to be within these limits.	Where national and/or international requirements set limits for ETP species, there is a high degree of certainty that the combined effects of the MSC UoAs are within these limits.
	Met?	NO, adequate info lacking for ETPs esp sharks, turtles	(Y/N/Not relevant)	(Y/N/Not relevant)
b	Direct effects			
	Guidepost	Known direct effects of the UoA are likely to not hinder recovery of ETP species.	Known direct effects of the UoA are highly likely to not hinder recovery of ETP species.	There is a high degree of confidence that there are no significant detrimental direct effects of the UoA on ETP species.
	Met?	NO, adequate info lacking for direct effects on ETPs	(Y/N)	(Y/N)
c	Indirect effects			
	Guidepost		Indirect effects have been considered and are thought to be highly likely to not create unacceptable impacts.	There is a high degree of confidence that there are no significant detrimental indirect effects of the fishery on ETP species.

PI 2.3.1	The UoA meets national and international requirements for the protection of ETP species The UoA does not hinder recovery of ETP species		
Met?		NO, adequate information is lacking for indirect effects on ETPs	(Y/N)
Overall PI justification	Adequate information lacking for ETPs especially sharks, turtles Adequate information lacking for direct effects on ETPs Adequate information lacking for indirect effects on ETPs		
References	Not available		
RBF Required? (✓/✗/)	✓ RBF Required	Likely PI Scoring Level (<60, 60-79, ≥ 80)	<60

Evaluation Table for PI 2.3.2 – ETP species management strategy

PI 2.3.2	The UoA has in place precautionary management strategies designed to: <ul style="list-style-type: none"> • meet national and international requirements; • Ensure the UoA does not hinder recovery of ETP species. Also, the UoA regularly reviews and implements measures, as appropriate, to minimize the mortality of ETP species.		
Scoring Issue	SG 60	SG 80	SG 100
a	Management strategy in place (national and international requirements) [Scoring issue need not be scored if <u>there are no</u> requirements for protection or rebuilding provided through national ETP legislation or international agreements].		
Guidepost	There are measures in place that minimize the UoA-related mortality of ETP species, and are expected to be highly likely to achieve national and international requirements for the protection of ETP species.	There is a strategy in place for managing the UoA’s impact on ETP species, including measures to minimize mortality, which is designed to be highly likely to achieve national and international requirements for the protection of ETP species.	There is a comprehensive strategy in place for managing the UoA’s impact on ETP species, including measures to minimize mortality, which is designed to achieve above national and international requirements for the protection of ETP species.
Met?	YES, general fisheries regulations are in place within the Fisheries Act, some are proposed in the Ring net management plan; however, fishery specific measures have not been put in place.	(Y/N/Not relevant)	(Y/N/Not relevant)
b	Management strategy in place (alternative) [Scoring issue need not be scored if <u>there are</u> requirements for protection or rebuilding provided through national ETP legislation or international agreements].		
Guidepost	There are measures in place that are expected to ensure the UoA does not hinder the recovery of ETP species.	There is a strategy in place that is expected to ensure the UoA does not hinder the recovery of ETP species.	There is a comprehensive strategy in place for managing ETP species, to ensure the UoA does not hinder the recovery of ETP species
Met?	(Y/N/Not relevant)	(Y/N/Not relevant)	YES, comprehensive measures are in place: - - sea turtle strategy - Sea turtle Action plan - Wildlife Act, on ETPs

PI 2.3.2	<p>The UoA has in place precautionary management strategies designed to:</p> <ul style="list-style-type: none"> • meet national and international requirements; • Ensure the UoA does not hinder recovery of ETP species. <p>Also, the UoA regularly reviews and implements measures, as appropriate, to minimize the mortality of ETP species.</p>		
			<p>- Fisheries Act - IPOAs etc.)</p>
c	Management strategy evaluation		
Guidepost	<p>The measures are considered likely to work, based on plausible argument (e.g. general experience, theory or comparison with similar fisheries/species).</p>	<p>There is an objective basis for confidence that the measures/strategy will work, based on information directly about the fishery and/or the species involved.</p>	<p>The strategy/comprehensive strategy is mainly based on information directly about the fishery and/or species involved, and a quantitative analysis supports high confidence that the strategy will work.</p>
Met?	<p>YES, the existing legislative structures will work based on information from other fisheries such as the trawls, purse seines and other fisheries etc</p>	(Y/N)	(Y/N)
d	Management strategy implementation		
Guidepost		<p>There is some evidence that the measures/strategy is being implemented successfully.</p>	<p>There is clear evidence that the strategy/comprehensive strategy is being implemented successfully and is achieving its objective as set out in scoring issue (a) or (b).</p>
Met?		<p>NO, no evidence available for measures being implemented specific to the fishery</p>	(Y/N)
e	Review of alternative measures to minimize mortality of ETP species		
Guidepost	<p>There is a review of the potential effectiveness and practicality of alternative measures to minimize UoA-related mortality of ETP species.</p>	<p>There is a regular review of the potential effectiveness and practicality of alternative measures to minimize UoA-related mortality of ETP species and they are implemented as appropriate.</p>	<p>There is a biennial review of the potential effectiveness and practicality of alternative measures to minimize UoA-related mortality ETP species, and they are implemented, as appropriate.</p>
Met?	<p>NO, none available, no reviews planned as yet</p>	(Y/N)	(Y/N)
Overall PI justification	<p>General fisheries regulations are in place within the Fisheries Act, some are proposed in the Ring net management plan, however, and fishery specific measures have not been put in place. Comprehensive measures are in place: - - sea turtle strategy</p>		

<p>PI 2.3.2</p>	<p>The UoA has in place precautionary management strategies designed to:</p> <ul style="list-style-type: none"> • meet national and international requirements; • Ensure the UoA does not hinder recovery of ETP species. <p>Also, the UoA regularly reviews and implements measures, as appropriate, to minimize the mortality of ETP species.</p>		
	<p>- Sea turtle Action plan - Wildlife Act, on ETPs - Fisheries Act - IPOAs etc.)</p> <p>The existing legislative structures will work based on information from other fisheries such as the trawls, purse seines and other fisheries etc No evidence available for measures being implemented specific to the fishery</p>		
<p>References</p>	<p>Fisheries Development and Management Act 2016; Wildlife act; Sea turtle strategy</p>		
<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 70%; text-align: center;">Likely PI Scoring Level (<60, 60-79, ≥ 80)</td> <td style="width: 30%; text-align: center; background-color: red; color: white; font-weight: bold; font-size: 1.2em;"><60</td> </tr> </table>		Likely PI Scoring Level (<60, 60-79, ≥ 80)	<60
Likely PI Scoring Level (<60, 60-79, ≥ 80)	<60		

Evaluation Table for PI 2.3.3 – ETP species information

<p>PI 2.3.3</p>	<p>Relevant information is collected to support the management of UoA impacts on ETP species, including:</p> <ul style="list-style-type: none"> • Information for the development of the management strategy; • Information to assess the effectiveness of the management strategy; and • Information to determine the outcome status of ETP species. 		
<p>Scoring Issue</p>	<p>SG 60</p>	<p>SG 80</p>	<p>SG 100</p>
<p>a</p>	<p>Information adequacy for assessment of impacts</p>		
<p>Guidpost</p>	<p>Qualitative information is adequate to estimate the UoA related mortality on ETP species. OR If RBF is used to score PI 2.3.1 for the UoA: Qualitative information is adequate to estimate productivity and susceptibility attributes for ETP species.</p>	<p>Some quantitative information is adequate to assess the UoA related mortality and impact and to determine whether the UoA may be a threat to protection and recovery of the ETP species. OR If RBF is used to score PI 2.3.1 for the UoA: Some quantitative information is adequate to assess productivity and susceptibility attributes for ETP species.</p>	<p>Quantitative information is available to assess with a high degree of certainty the magnitude of UoA-related impacts, mortalities and injuries and the consequences for the status of ETP species.</p>
<p>Met?</p>	<p>NO, information is lacking on ETPs</p>	<p>(Y/N)</p>	<p>(Y/N)</p>
<p>b</p>	<p>Information adequacy for management strategy</p>		
<p>Guidpost</p>	<p>Information is adequate to support measures to manage the impacts on ETP species.</p>	<p>Information is adequate to measure trends and supports a strategy to manage impacts on ETP species.</p>	<p>Information is adequate to support a comprehensive strategy to manage impacts, minimize mortality and injury of ETP species, and evaluate with a high degree of certainty whether a strategy is achieving its objectives.</p>
<p>Met?</p>	<p>NO, information is evidently lacking</p>	<p>(Y/N)</p>	<p>(Y/N)</p>

PI 2.3.3	<p>Relevant information is collected to support the management of UoA impacts on ETP species, including:</p> <ul style="list-style-type: none"> • Information for the development of the management strategy; • Information to assess the effectiveness of the management strategy; and • Information to determine the outcome status of ETP species.
Overall PI justification	Information on ETPs is evidently lacking
References	Not available
Likely PI Scoring Level (<60, 60-79, ≥ 80)	
<60	

Evaluation Table for PI 2.4.1 – Habitats outcome

PI 2.4.1	The UoA does not cause serious or irreversible harm to habitat structure and function, considered on the basis of the area covered by the governance body(s) responsible for fisheries management in the area(s) where the UoA operates.		
Scoring Issue	SG 60	SG 80	SG 100
a	Commonly encountered habitat status		
Guidepost	The UoA is unlikely to reduce structure and function of the commonly encountered habitats to a point where there would be serious or irreversible harm.	The UoA is highly unlikely to reduce structure and function of the commonly encountered habitats to a point where there would be serious or irreversible harm.	There is evidence that the UoA is highly unlikely to reduce structure and function of the commonly encountered habitats to a point where there would be serious or irreversible harm.
Met?	YES, based on gear operation/deployment (KMFRI reports); the drop line gear (pelagic) is unlikely to have deleterious impacts on the habitats to irrecoverable states	(Y/N)	(Y/N)
b	VME habitat status [Scoring issue need not be scored if there are no VMEs].		
Guidepost	The UoA is unlikely to reduce structure and function of the VME habitats to a point where there would be serious or irreversible harm.	The UoA is highly unlikely to reduce structure and function of the VME habitats to a point where there would be serious or irreversible harm.	There is evidence that the UoA is highly unlikely to reduce structure and function of the VME habitats to a point where there would be serious or irreversible harm.
Met?	YES, based on gear operation/deployment (KMFRI reports); the drop line gear (pelagic) is unlikely to have deleterious impacts on the VMEs to irrecoverable states	(Y/N/Not relevant)	(Y/N/Not relevant)
c	Minor habitat status		
Guidepost			There is evidence that the UoA is highly unlikely to reduce structure and function of the minor habitats to a point where

PI 2.4.1	The UoA does not cause serious or irreversible harm to habitat structure and function, considered on the basis of the area covered by the governance body(s) responsible for fisheries management in the area(s) where the UoA operates.		
			there would be serious or irreversible harm.
	Met?		YES, based on gear operation/ deployment (KMFRI reports, Drop line trials); the drop line gear (pelagic) is unlikely to have deleterious impacts on the habitats to irrecoverable states
Overall PI justification	Based on gear operation/deployment (KMFRI reports); the drop line gear (pelagic) is unlikely to have deleterious impacts on the habitats to irrecoverable states Based on gear operation/deployment (KMFRI reports); the drop line gear (pelagic) is unlikely to have deleterious impacts on the VMEs to irrecoverable states		
References	KEMFRI reports		
RBF Required? (✓/✗/)	X	Likely PI Scoring Level (<60, 60-79, ≥ 80)	<60

Evaluation Table for PI 2.4.2 – Habitats management strategy

PI 2.4.2	There is a strategy in place that is designed to ensure the UoA does not pose a risk of serious or irreversible harm to the habitats.		
Scoring Issue	SG 60	SG 80	SG 100
a	Management strategy in place		
	Guidepost	There are measures in place, if necessary, that are expected to achieve the Habitat Outcome 80 level of performance.	There is a partial strategy in place, if necessary, that is expected to achieve the Habitat Outcome 80 level of performance or above.
	Met?	YES, no management plan in place, but general measures on fisheries from the Fisheries Act, etc. are in place on operations etc.	(Y/N)
b	Management strategy evaluation		
	Guidepost	The measures are considered likely to work, based on plausible argument (e.g. general experience, theory or comparison with similar UoAs/habitats).	There is some objective basis for confidence that the measures/partial strategy will work, based on information directly about the UoA and/or habitats involved.
	Met?	YES, there are no measures in place for this fishery but available measures for other line fisheries are applied to this fishery	(Y/N)
c	Management strategy implementation		
	Guidepost		There is some quantitative evidence that the measures/partial strategy is being implemented successfully.
			There is clear quantitative evidence that the partial strategy/strategy is being implemented successfully and is achieving its

PI 2.4.2	There is a strategy in place that is designed to ensure the UoA does not pose a risk of serious or irreversible harm to the habitats.		
Met?		YES, there is plausible evidence (Mtafiti, FAO surveys etc.) based on research and surveys that the general measures are being implemented successfully	objective, as outlined in scoring issue (a). (Y/N)
d	Compliance with management requirements and other MSC UoAs'/non-MSC fisheries' measures to protect VMEs [Scoring issue need not be scored if there are no VMEs].		
Guidepost	There is qualitative evidence that the UoA complies with its management requirements to protect VMEs.	There is some quantitative evidence that the UoA complies with both its management requirements and with protection measures afforded to VMEs by other MSC UoAs/non-MSC fisheries, where relevant.	There is clear quantitative evidence that the UoA complies with both its management requirements and with protection measures afforded to VMEs by other MSC UoAs/non-MSC fisheries, where relevant.
Met?	YES, there are no measures in place for this fishery but fishery complied with available measures for other line fisheries	(Y/N/Not relevant)	(Y/N/Not relevant)
Overall PI justification	No management plan in place, but general measures on fisheries from the Fisheries Act, etc. are in place on operations etc. There are no measures in place for this fishery but available measures for other line fisheries are applied to this fishery There is plausible evidence (Mtafiti, FAO surveys etc.) based on research and surveys that the general measures are being implemented successfully There are no measures in place for this fishery but fishery complied with available measures for other line fisheries		
References	FAO surveys; Mtafiti findings and reports		
Likely PI Scoring Level (<60, 60-79, ≥ 80)		60-79	

Evaluation Table for PI 2.4.3 – Habitats information

PI 2.4.3	Information is adequate to determine the risk posed to the habitat by the UoA and the effectiveness of the strategy to manage impacts on the habitat.			
Scoring Issue	SG 60	SG 80	SG 100	
a	Information quality			
	Guidepost	The types and distribution of the main habitats are broadly understood . OR If CSA is used to score PI 2.4.1 for the UoA: Qualitative information is adequate to estimate the types and distribution of the main habitats.	The nature, distribution and vulnerability of the main habitats in the UoA area are known at a level of detail relevant to the scale and intensity of the UoA. OR If CSA is used to score PI 2.4.1 for the UoA: Some quantitative information is available and is adequate to estimate the types and distribution of the main habitats.	The distribution of all habitats is known over their range, with particular attention to the occurrence of vulnerable habitats.
	Met?	YES, habitat distribution broadly understood, some mapping done	(Y/N)	(Y/N)
b	Information adequacy for assessment of impacts			
	Guidepost	Information is adequate to broadly understand the nature of the main impacts of gear use on the main habitats, including spatial overlap of habitat with fishing gear. OR If CSA is used to score PI 2.4.1 for the UoA: Qualitative information is adequate to estimate the consequence and spatial attributes of the main habitats.	Information is adequate to allow for identification of the main impacts of the UoA on the main habitats, and there is reliable information on the spatial extent of interaction and on the timing and location of use of the fishing gear. OR If CSA is used to score PI 2.4.1 for the UoA: Some quantitative information is available and is adequate to estimate the consequence and spatial attributes of the main habitats.	The physical impacts of the gear on all habitats have been quantified fully.
	Met?	YES, habitat distribution broadly understood, some mapping done Ref: FAO, Mtafiti and mapping done	(Y/N)	(Y/N)
c	Monitoring			
	Guidepost		Adequate information continues to be collected to detect any increase in risk to the main habitats.	Changes in habitat distributions over time are measured.

PI 2.4.3	Information is adequate to determine the risk posed to the habitat by the UoA and the effectiveness of the strategy to manage impacts on the habitat.		
Met?		NO, inadequate surveys done to assess impacts on habitats	(Y/N)
Overall PI justification	Habitat distribution broadly understood, some mapping done Habitat distribution broadly understood, some mapping done Inadequate surveys done to assess impacts on habitats		
References	FAO, Mtafiti and mapping done		
		Likely PI Scoring Level (<60, 60-79, ≥ 80)	<60

Evaluation Table for PI 2.5.1 – Ecosystem outcome

PI 2.5.1	The UoA does not cause serious or irreversible harm to the key elements of ecosystem structure and function.		
Scoring Issue	SG 60	SG 80	SG 100
a	Ecosystem status		
Guidepost	The UoA is unlikely to disrupt the key elements underlying ecosystem structure and function to a point where there would be a serious or irreversible harm.	The UoA is highly unlikely to disrupt the key elements underlying ecosystem structure and function to a point where there would be a serious or irreversible harm.	There is evidence that the UoA is highly unlikely to disrupt the key elements underlying ecosystem structure and function to a point where there would be a serious or irreversible harm.
Met?	YES, based on gear operation/deployment (Drop line surveys); the gear is unlikely to have deleterious impacts on the key elements of the ecosystems to irreversible states	(Y/N/Partial)	(Y/N/Partial)
Overall PI justification	Based on gear operation/deployment (Drop line surveys); the gear is unlikely to have deleterious impacts on the key elements of the ecosystems to irreversible states		
References	FAO reports		
RBF Required? (✓/×/)	×	Likely PI Scoring Level (<60, 60-79, ≥ 80)	60-79

Evaluation Table for PI 2.5.2 – Ecosystem management strategy

PI 2.5.2	There are measures in place to ensure the UoA does not pose a risk of serious or irreversible harm to ecosystem structure and function.		
Scoring Issue	SG 60	SG 80	SG 100
a	Management strategy in place		
Guidepost	There are measures in place, if necessary which take into account the potential impacts of the fishery on key elements of the ecosystem.	There is a partial strategy in place, if necessary, which takes into account available information and is expected to restrain impacts of the UoA on the ecosystem so as to achieve the Ecosystem Outcome 80 level of performance.	There is a strategy that consists of a plan , in place which contains measures to address all main impacts of the UoA on the ecosystem, and at least some of these measures are in place.

PI 2.5.2		There are measures in place to ensure the UoA does not pose a risk of serious or irreversible harm to ecosystem structure and function.		
	Met?	NO measures for the dropline fisheries	(Y/N)	(Y/N)
b	Management strategy evaluation			
	Guidepost	The measures are considered likely to work, based on plausible argument (e.g., general experience, theory or comparison with similar fisheries/ ecosystems).	There is some objective basis for confidence that the measures/partial strategy will work, based on some information directly about the UoA and/or the ecosystem involved	Testing supports high confidence that the partial strategy/strategy will work, based on information directly about the UoA and/or ecosystem involved
	Met?	NO evaluations for the dropline fisheries	(Y/N)	(Y/N)
c	Management strategy implementation			
	Guidepost		There is some evidence that the measures/partial strategy is being implemented successfully.	There is clear evidence that the partial strategy/strategy is being implemented successfully and is achieving its objective as set out in scoring issue (a).
	Met?		NO evidence for implementation of measures for the dropline fisheries	(Y/N)
Overall PI justification		NO measures for the drop line fisheries NO evaluations for the drop line fisheries NO evidence for implementation of measures for the dropline fisheries		
References		Not available		
			Likely PI Scoring Level (<60, 60-79, ≥ 80)	<60

Evaluation Table for PI 2.5.3 – Ecosystem information

PI 2.5.3		There is adequate knowledge of the impacts of the UoA on the ecosystem.		
Scoring Issue		SG 60	SG 80	SG 100
a	Information quality			
	Guidepost	Information is adequate to identify the key elements of the ecosystem.	Information is adequate to broadly understand the key elements of the ecosystem.	
	Met?	NO, information inadequate	(Y/N)	
b	Investigation of UoA impacts			
	Guide post	Main impacts of the UoA on these key ecosystem elements can be inferred from existing information, but have not been investigated in detail.	Main impacts of the UoA on these key ecosystem elements can be inferred from existing information, and some have been investigated in detail.	Main interactions between the UoA and these ecosystem elements can be inferred from existing information, and have been investigated in detail.
	Met?	YES, impacts can be deduced from other	(Y/N)	(Y/N)

PI 2.5.3	There is adequate knowledge of the impacts of the UoA on the ecosystem.		
	line fisheries, but specific assessments are lacking		
c	Understanding of component functions		
	Guide post		The main functions of the components (i.e., P1 target species, primary, secondary and ETP species and Habitats) in the ecosystem are known .
		The impacts of the UoA on P1 target species, primary, secondary and ETP species and Habitats are identified and the main functions of these components in the ecosystem are understood .	
	Met?		NO, information lacking; but there is ongoing surveys; SOLSTICE & RV Mtafiti Surveys
			(Y/N)
d	Information relevance		
	Guidepost		Adequate information is available on the impacts of the UoA on these components to allow some of the main consequences for the ecosystem to be inferred.
		Adequate information is available on the impacts of the UoA on the components and elements to allow the main consequences for the ecosystem to be inferred.	
	Met?		NO, information on impacts is not available
			(Y/N)
e	Monitoring		
	Guidepost		Adequate data continue to be collected to detect any increase in risk level.
		Information is adequate to support the development of strategies to manage ecosystem impacts.	
	Met?		NO, only general fishery data (catch, effort) is collected, little focus on risk levels
			(Y/N)
Overall PI justification	Information inadequate Impacts can be deduced from other line fisheries, but specific assessments are lacking information lacking; but there is ongoing surveys; SOLSTICE & RV Mtafiti Surveys Information on impacts is not available Only general fishery data (catch, effort) is collected, little focus on risk levels		
References	KEMFRI and SDF&BE reports; Mtafiti surveys and SOLSTICE surveys		
	Likely PI Scoring Level (<60, 60-79, ≥ 80)		<60

Principle 3 Effective and responsible management

Evaluation Table for PI 3.1.1 – Legal and/or customary framework

PI 3.1.1	The management system exists within an appropriate legal and/or customary framework which ensures that it: <ul style="list-style-type: none"> • Is capable of delivering sustainability in the UoA(s); and • Observes the legal rights created explicitly or established by custom of people dependent on fishing for food or livelihood; and • Incorporates an appropriate dispute resolution framework. 		
Scoring Issue	SG 60	SG 80	SG 100
a	Compatibility of laws or standards with effective management		
Guidepost	There is an effective national legal system and a framework for cooperation with other parties, where necessary, to deliver management outcomes consistent with MSC Principles 1 and 2	There is an effective national legal system and organized and effective cooperation with other parties, where necessary, to deliver management outcomes consistent with MSC Principles 1 and 2.	There is an effective national legal system and binding procedures governing cooperation with other parties which delivers management outcomes consistent with MSC Principles 1 and 2.
Met?	(YES, Fisheries law in place, BMU regulations, ICZM framework, Kenya constitution of Kenya 2010; Wildlife Act, EMCA etc.)	(Y/N)	(Y/N)
b	Resolution of disputes		
Guidepost	The management system incorporates or is subject by law to a mechanism for the resolution of legal disputes arising within the system.	The management system incorporates or is subject by law to a transparent mechanism for the resolution of legal disputes which is considered to be effective in dealing with most issues and that is appropriate to the context of the UoA.	The management system incorporates or is subject by law to a transparent mechanism for the resolution of legal disputes that is appropriate to the context of the fishery and has been tested and proven to be effective .
Met?	(Y/N)	YES, the legal systems are in place from BMU, co-mgt, Fisheries Act etc. but some flaws exist in the implementation etc.	(Y/N)
c	Respect for rights		
Guidepost	The management system has a mechanism to generally respect the legal rights created explicitly or established by custom of people dependent on fishing for food or livelihood in a manner consistent with the objectives of MSC Principles 1 and 2.	The management system has a mechanism to observe the legal rights created explicitly or established by custom of people dependent on fishing for food or livelihood in a manner consistent with the objectives of MSC Principles 1 and 2.	The management system has a mechanism to formally commit to the legal rights created explicitly or established by custom of people dependent on fishing for food and livelihood in a manner consistent with the objectives of MSC Principles 1 and 2.

PI 3.1.1	The management system exists within an appropriate legal and/or customary framework which ensures that it: <ul style="list-style-type: none"> • Is capable of delivering sustainability in the UoA(s); and • Observes the legal rights created explicitly or established by custom of people dependent on fishing for food or livelihood; and • Incorporates an appropriate dispute resolution framework. 		
Met?	(Y/N)	(Y/N)	YES, BMUs regulations show clear mandate to commit legal rights to resource users, Constitution of Kenya and Fisheries Act etc.)
Overall PI justification	Fisheries law in place, BMU regulations, ICZM framework, Kenya constitution of Kenya 2010; Wildlife Act, EMCA etc. The legal systems are in place from BMU, co-mgt, Fisheries Act etc. but some flaws exist in the implementation etc. BMUs regulations show clear mandate to commit legal rights to resource users, Constitution of Kenya and Fisheries Act etc.		
References	BMU regulations 2007; Fisheries Development and Management Act 2016; ICZM framework; Kenya constitution 2010; EMCA 1999		
		Likely PI Scoring Level (<60, 60-79, ≥ 80)	60-79

Evaluation Table for PI 3.1.2 – Consultation, roles and responsibilities

PI 3.1.2	The management system has effective consultation processes that are open to interested and affected parties. The roles and responsibilities of Organizations and individuals who are involved in the management process are clear and understood by all relevant parties		
Scoring Issue	SG 60	SG 80	SG 100
a	Roles and responsibilities		
Guidepost	Organizations and individuals involved in the management process have been identified. Functions, roles and responsibilities are generally understood .	Organizations and individuals involved in the management process have been identified. Functions, roles and responsibilities are explicitly defined and well understood for key areas of responsibility and interaction.	Organizations and individuals involved in the management process have been identified. Functions, roles and responsibilities are explicitly defined and well understood for all areas of responsibility and interaction.
Met?	(Y/N)	(Y/N)	YES, explicitly defined & well understood for key areas of responsibility & interaction as per legal framework e.g. Wildlife Act for ETPs, EMCA for environmental issues etc.
b	Consultation processes		
Guidepost	The management system includes consultation processes that obtain relevant information from the main affected parties, including local knowledge, to inform	The management system includes consultation processes that regularly seek and accept relevant information, including local knowledge. The management system demonstrates	The management system includes consultation processes that regularly seek and accept relevant information, including local knowledge. The management system demonstrates

PI 3.1.2	The management system has effective consultation processes that are open to interested and affected parties. The roles and responsibilities of Organizations and individuals who are involved in the management process are clear and understood by all relevant parties		
	the management system.	consideration of the information obtained.	consideration of the information and explains how it is used or not used.
	Met?	(Y/N)	YES, Consultation processes are in place but not regular based on time frames, to inform management system (Y/N)
c	Participation		
	Guidepost		The consultation process provides opportunity for all interested and affected parties to be involved. The consultation process provides opportunity and encouragement for all interested and affected parties to be involved, and facilitates their effective engagement.
	Met?	(Y/N)	YES, Consultations are encouraged, opportunities provided, and facilitation for BMUs, Stakeholders etc. given wherever opportunity arises
Overall PI justification	Explicitly defined & well understood for key areas of responsibility & interaction as per legal framework e.g. Wildlife Act for ETPs, EMCA for environmental issues etc. Consultation processes are in place but not regular based on time frames, to inform management system Consultations are encouraged, opportunities provided, and facilitation for BMUs, Stakeholders etc. given wherever opportunity arises		
References	BMU regulations 2007; Fisheries Development and Management Act 2016; ICZM framework; Kenya constitution 2010; EMCA 1999		
	Likely PI Scoring Level (<60, 60-79, ≥ 80)		≥ 80

Evaluation Table for PI 3.1.3 – Long term objectives

PI 3.1.3	The management policy has clear long-term objectives to guide decision-making that are consistent with MSC fisheries standard, and incorporates the precautionary approach.			
Scoring Issue	SG 60	SG 80	SG 100	
a	Objectives			
	Guidepost	Long-term objectives to guide decision-making, consistent with the MSC fisheries standard and the precautionary approach, are implicit within management policy.	Clear long-term objectives that guide decision-making, consistent with MSC fisheries standard and the precautionary approach are explicit within management policy.	Clear long-term objectives that guide decision-making, consistent with MSC fisheries standard and the precautionary approach, are explicit within and required by management policy.
	Met?	(Y/N/Partial)	(Y/N/Partial)	YES, Fisheries Act: calls for EAF approach to management at no less standards than defined in international agreements;

PI 3.1.3	The management policy has clear long-term objectives to guide decision-making that are consistent with MSC fisheries standard, and incorporates the precautionary approach.		
			IOTC, UNCLOS, IPOAs etc.
Overall PI justification	Fisheries Act: calls for EAF approach to management at no less standards than defined in international agreements; IOTC, UNCLOS, IPOAs etc.		
References	IOTC; UNCLOS 1982; Fisheries Development and Management Act 2016		
	Likely PI Scoring Level (<60, 60-79, ≥ 80)		≥ 80

Evaluation Table for PI 3.2.1 Fishery-specific objectives

PI 3.2.1	The fishery-specific management system has clear, specific objectives designed to achieve the outcomes expressed by MSC’s Principles 1 and 2.		
Scoring Issue	SG 60	SG 80	SG 100
a	Objectives		
	Guidepost	Objectives , which are broadly consistent with achieving the outcomes expressed by MSC’s Principles 1 and 2, are implicit within the fishery-specific management system.	Short and long-term objectives , which are consistent with achieving the outcomes expressed by MSC’s Principles 1 and 2, are explicit within the fishery-specific management system.
	Met?	NO, there is no management plan for fishery	(Y/N/Partial)
Overall PI justification	There is no management plan for fishery		
References	Not available		
	Likely PI Scoring Level (<60, 60-79, ≥ 80)		<60

Evaluation Table for PI 3.2.2 – Decision-making processes

PI 3.2.2	The fishery-specific management system includes effective decision-making processes that result in measures and strategies to achieve the objectives, and has an appropriate approach to actual disputes in the fishery.		
Scoring Issue	SG 60	SG 80	SG 100
a	Decision-making processes		
	Guide post	There are some decision-making processes in place that result in measures and strategies to achieve the fishery-specific objectives.	There are established decision-making processes that result in measures and strategies to achieve the fishery-specific objectives.
	Met?	YES, some decision making processes are in place but not specific to the fishery	(Y/N)
b	Responsiveness of decision-making processes		
	Guide post	Decision-making processes respond to serious issues identified in relevant research, monitoring,	Decision-making processes respond to serious and other important issues identified in relevant
			Decision-making processes respond to all issues identified in relevant research, monitoring,

PI 3.2.2		The fishery-specific management system includes effective decision-making processes that result in measures and strategies to achieve the objectives, and has an appropriate approach to actual disputes in the fishery.		
		evaluation and consultation, in a transparent, timely and adaptive manner and take some account of the wider implications of decisions.	research, monitoring, evaluation and consultation, in a transparent, timely and adaptive manner and take account of the wider implications of decisions.	evaluation and consultation, in a transparent, timely and adaptive manner and take account of the wider implications of decisions.
	Met?	YES, are in place, respond to serious issues, take into account implications of decisions		(Y/N)
c		Use of precautionary approach		
	Guide post		Decision-making processes use the precautionary approach and are based on best available information.	
	Met?		Yes, EAF approach well streamlined but no fishery management in place	
d		Accountability and transparency of management system and decision-making process		
	Guide post	Some information on the fishery's performance and management action is generally available on request to stakeholders.	Information on the fishery's performance and management action is available on request, and explanations are provided for any actions or lack of action associated with findings and relevant recommendations emerging from research, monitoring, evaluation and review activity.	Formal reporting to all interested stakeholders provides comprehensive information on the fishery's performance and management actions and describes how the management system responded to findings and relevant recommendations emerging from research, monitoring, evaluation and review activity.
	Met?	YES, some information on the fishery's performance is available from surveys, some monitoring etc.	(Y/N)	(Y/N)
e		Approach to disputes		
	Guide post	Although the management authority or fishery may be subject to continuing court challenges, it is not indicating a disrespect or defiance of the law by repeatedly violating the same law or regulation necessary for the sustainability for the fishery.	The management system or fishery is attempting to comply in a timely fashion with judicial decisions arising from any legal challenges.	The management system or fishery acts proactively to avoid legal disputes or rapidly implements judicial decisions arising from legal challenges.
	Met?	(Y/N)	YES, a lot of effort has been put into dispute resolution, attempts to	(Y/N)

PI 3.2.2	The fishery-specific management system includes effective decision-making processes that result in measures and strategies to achieve the objectives, and has an appropriate approach to actual disputes in the fishery.		
			comply are evident by the management
Overall PI justification	Some decision making processes are in place but not specific to the fishery are in place, respond to serious issues, take into account implications of decisions EAF approach well streamlined but no fishery management in place Some information on the fishery's performance is available from surveys, some monitoring etc. A lot of effort has been put into dispute resolution, attempts to comply are evident by the management		
References	Stakeholder consultation minutes		
		Likely PI Scoring Level (<60, 60-79, ≥ 80)	60-79

Evaluation Table for PI 3.2.3 – Compliance and enforcement

PI 3.2.3	Monitoring, control and surveillance mechanisms ensure the management measures in the fishery are enforced and complied with.		
Scoring Issue	SG 60	SG 80	SG 100
a	MCS implementation		
Guidepost	Monitoring, control and surveillance mechanisms exist, and are implemented in the fishery and there is a reasonable expectation that they are effective.	A monitoring, control and surveillance system has been implemented in the fishery and has demonstrated an ability to enforce relevant management measures, strategies and/or rules.	A comprehensive monitoring, control and surveillance system has been implemented in the fishery and has demonstrated a consistent ability to enforce relevant management measures, strategies and/or rules.
Met?	YES, MCS mechanisms are in place for the general line fisheries, though non-specific to the Snapper fishery in the north	(Y/N)	(Y/N)
b	Sanctions		
Guidepost	Sanctions to deal with non-compliance exist and there is some evidence that they are applied.	Sanctions to deal with non-compliance exist, are consistently applied and thought to provide effective deterrence.	Sanctions to deal with non-compliance exist, are consistently applied and demonstrably provide effective deterrence.
Met?	YES, sanctions exist, but no evidence for application	(Y/N)	(Y/N)
c	Compliance		
Guidepost	Fishers are generally thought to comply with the management system for the fishery under assessment, including, when required, providing information of importance to the effective management of the fishery.	Some evidence exists to demonstrate fishers comply with the management system under assessment, including, when required, providing information of importance to the effective management of the fishery.	There is a high degree of confidence that fishers comply with the management system under assessment, including, providing information of importance to the effective management of the fishery.

PI 3.2.3		Monitoring, control and surveillance mechanisms ensure the management measures in the fishery are enforced and complied with.		
	Met?	YES, fisheries generally comply with general management regulations	(Y/N)	(Y/N)
d	Systematic non-compliance			
	Guidepost		There is no evidence of systematic non-compliance.	
	Met?		YES, general compliance, and no systemic non-compliance	
Overall PI justification		Sanctions exist, but no evidence for application MCS mechanisms are in place for the general line fisheries, though non-specific to the Snapper fishery in the north Fisheries generally comply with general management regulations general compliance, and no systemic non-compliance		
References		Stakeholder minutes		
			Likely PI Scoring Level (<60, 60-79, ≥ 80)	60-79

Evaluation Table for PI 3.2.4 – Monitoring and management performance evaluation

PI 3.2.4		There is a system of monitoring and evaluating the performance of the fishery-specific management system against its objectives. There is effective and timely review of the fishery-specific management system.		
Scoring Issue		SG 60	SG 80	SG 100
a	Evaluation coverage			
	Guidepost	There are mechanisms in place to evaluate some parts of the fishery-specific management system.	There are mechanisms in place to evaluate key parts of the fishery-specific management system	There are mechanisms in place to evaluate all parts of the fishery-specific management system.
	Met?	NO, there are no mechanisms in place for the fishery, no management system	(Y/N)	(Y/N)
b	Internal and/or external review			
	Guidepost	The fishery-specific management system is subject to occasional internal review.	The fishery-specific management system is subject to regular internal and occasional external review.	The fishery-specific management system is subject to regular internal and external review.
	Met?	NO, there are no mechanisms in place for the fishery, no management system, no reviews	(Y/N)	(Y/N)
Overall PI justification		There are no mechanisms in place for the fishery, No management system, no reviews		
References		Not available		
			Likely PI Scoring Level (<60, 60-79, ≥ 80)	<60

Appendix 12: MSC's BMT Baseline Status & 5-year projections for North Kenya Bank Fishery

Principle	Component	Performance Indicator	Actual 2019	Expected 2020	Expected 2021	Expected 2022	Expected 2023
1	Outcome	1.1.1 Stock status	<60	<60	<60	60-79	60-79
		1.1.2 Stock rebuilding	---	---	---	---	---
	Management	1.2.1 Harvest Strategy	<60	<60	<60	<60	60-79
		1.2.2 Harvest control rules and	<60	<60	<60	<60	60-79
		1.2.3 Information and monitoring	<60	<60	60-79	≥80	≥80
		1.2.4 Assessment of stock status	<60	<60	60-79	60-79	≥80
2	Primary species	2.1.1 Outcome	<60	<60	<60	60-79	60-79
		2.1.2 Management	<60	<60	60-79	60-79	≥80
		2.1.3 Information	<60	60-79	60-79	≥80	≥80
	Secondary species	2.2.1 Outcome	<60	<60	<60	60-79	60-79
		2.2.2 Management	<60	<60	60-79	60-79	≥80
		2.2.3 Information	<60	60-79	60-79	≥80	≥80
	ETP species	2.3.1 Outcome	<60	<60	<60	60-79	60-79
		2.3.2 Management	<60	<60	60-79	60-79	≥80
		2.3.3 Information	<60	60-79	60-79	≥80	≥80
	Habitats	2.4.1 Outcome	<60	<60	<60	60-79	60-79
		2.4.2 Management	60-79	60-79	60-79	60-79	≥80
		2.4.3 Information	<60	60-79	60-79	≥80	≥80
	Ecosystem	2.5.1 Outcome	60-79	60-79	60-79	≥80	≥80
		2.5.2 Management	<60	<60	60-79	60-79	≥80
		2.5.3 Information	<60	60-79	60-79	≥80	≥80
3	Governance and Policy	3.1.1 Legal and customary	60-79	60-79	60-79	60-79	≥80
		3.1.2 Consultation, roles and responsibilities	≥80	≥80	≥80	≥80	≥80
		3.1.3 Long term objectives	≥80	≥80	≥80	≥80	≥80
	Fishery specific management system	3.2.1 Fishery specific objectives	<60	<60	60-79	60-79	≥80
		3.2.2 Decision making processes	60-79	60-79	60-79	≥80	≥80
		3.2.3 Compliance and enforcement	60-79	60-79	60-79	≥80	≥80
		3.2.4 Management performance evaluation	<60	<60	<60	60-79	60-79
Total number of PIs equal to or greater than 80			2	2	2	11	19
Total number of PIs 60-79			5	10	17	14	8
Total number of PIs less than 60			20	15	8	2	0
Overall BMT Index			0.17	0.26	0.39	0.67	0.85

Appendix 13: MSC Pre-assessment Results for Inshore Basket-trap Fishery

Principle 1: Sustainability of exploited stocks

Evaluation Table for PI 1.1.1 – Stock status

PI 1.1.1	The stock is at a level which maintains high productivity and has a low probability of recruitment overfishing		
Scoring Issue	SG 60	SG 80	SG 100
a	Stock status relative to recruitment impairment		
Guidepost	It is likely that the stock is above the point where recruitment would be impaired (PRI).	It is highly likely that the stock is above the PRI.	There is a high degree of certainty that the stock is above the PRI.
Met?	Yes, Using $SSB_{CURR} < SSB_0$ as proxy, likely to impair Recruitment	(Y/N)	(Y/N)
b	Stock status in relation to achievement of MSY		
Guidepost		The stock is at or fluctuating around a level consistent with MSY.	There is a high degree of certainty that the stock has been fluctuating around a level consistent with MSY or has been above this level over recent years.
Met?		Yes, but high risks for overexploitation due to multiple gears targeting the siganid species	(Y/N)
Overall PI justification	<60 SSB_{CURR} is below the SSB_{OPT} Using $SSB_{CURR} < SSB_0$ as proxy, likely to impair Recruitment but high risks for overexploitation due to multiple gears targeting the siganid species		
References	<ul style="list-style-type: none"> - Wambiji et al 2018 / Fact sheets, need for update - Hicks & McClanahan 2014 - Tuda et al 2016 		
RBF Required? (✓/✗/)	X	Likely PI Scoring Level (<60, 60-79, ≥ 80)	<60
Stock Status relative to Reference Points			
	Type of reference point	Value of reference point	Current stock status relative to reference point
Reference point used in scoring stock relative to PRI (SI-a)	$-SSB_{CURR}$, SSB_0 , SSB_{MSY}	$-SSB_{CURR}$: 825.5Mt $-SSB_0$: 1,000Mt $-SSB_{MSY}$: 2,227 Mt	$SSB_{CURR} / SSB_0 = 0.825.5$ $SSB_{CURR} / SSB_{MSY} = 0.37$
Reference point used in scoring	CPUE for mixed species in Basket	$CPUE_{MIXED}$: 2.0-5.5 kg/fisher/day	$F_{MSY} / F_{CURR} = 0.5$

PI 1.1.1	The stock is at a level which maintains high productivity and has a low probability of recruitment overfishing		
Scoring Issue	SG 60	SG 80	SG 100
stock relative to MSY (SI-b)	traps, & by species, & by site F_{MSY} , F_{CURR} Exploitation rate E_{MSY} , E_{curr}	CPUE _{s,sutor} : 4.1 kg/fisher/day F_{MSY} : 0.9 all gears F_{CURR} : 1.8 all gear E_{MSY} : 0.256 E_{CURR} : 0.68	$E_{MSY} / E_{CURR} = 0.3764$

Evaluation Table for PI 1.1.1A - key LTL [NOTE: only use this table for stocks identified as key Low Trophic Level]

PI 1.1.1 A	The stock is at a level which has a low probability of serious ecosystem impacts		
Scoring Issue	SG 60	SG 80	SG 100
a	Stock status relative to ecosystem impairment		
Guidepost	It is likely that the stock is above the point where serious ecosystem impacts could occur.	It is highly likely that the stock is above the point where serious ecosystem impacts could occur.	There is a high degree of certainty that the stock is above the point where serious ecosystem impacts could occur.
Met?	(Y/N)	(Y/N)	(Y/N)
b	Stock status in relation to ecosystem needs		
Guidepost		The stock is at or fluctuating around a level consistent with ecosystem needs.	There is a high degree of certainty that the stock has been fluctuating around a level consistent with ecosystem needs or has been above this level over recent years.
Met?		(Y/N)	(Y/N)
Overall PI justification	Not LTL		
References	Not available		
RBF Required? (✓/×/)	×	Likely PI Scoring Level (<60, 60-79, ≥ 80)	NO SCORE
Stock Status relative to Reference Points			
	Type of reference point	Value of reference point	Current stock status relative to reference point
Reference point used in scoring stock relative to ecosystem impairment (SIa)	[e.g. B _{35%}]	[Include value specifying units. e.g. 50,000t total stock biomass]	[Include current stock status in the same units as the reference point e.g. 90,000/B _{35%} =1.8]

PI 1.1.1 A	The stock is at a level which has a low probability of serious ecosystem impacts		
Scoring Issue	SG 60	SG 80	SG 100
a	Stock status relative to ecosystem impairment		
Guidepost	It is likely that the stock is above the point where serious ecosystem impacts could occur.	It is highly likely that the stock is above the point where serious ecosystem impacts could occur.	There is a high degree of certainty that the stock is above the point where serious ecosystem impacts could occur.
Met?	(Y/N)	(Y/N)	(Y/N)
b	Stock status in relation to ecosystem needs		
Guidepost		The stock is at or fluctuating around a level consistent with ecosystem needs.	There is a high degree of certainty that the stock has been fluctuating around a level consistent with ecosystem needs or has been above this level over recent years.
Met?		(Y/N)	(Y/N)
Overall PI justification	Not LTL		
References	Not available		
Reference point used in scoring stock relative to ecosystem needs (Slb)	[e.g. B _{75%}]	[Include value specifying units. e.g. 100,000t total stock biomass]	[Include current stock status in the same units as the reference point e.g. 90,000/B _{75%} =0.9]

Evaluation Table for PI 1.1.2 – Stock rebuilding

PI 1.1.2	Where the stock is reduced, there is evidence of stock rebuilding within a specified timeframe		
Scoring Issue	SG 60	SG 80	SG 100
a	Rebuilding timeframes		
Guidepost	A rebuilding timeframe is specified for the stock that is the shorter of 20 years or 2 times its generation time . For cases where 2 generations is less than 5 years, the rebuilding timeframe is up to 5 years.		The shortest practicable rebuilding timeframe is specified which does not exceed one generation time for the stock.
Met?	No, stock rebuilding plans in the fishery		(Y/N)

PI 1.1.2	Where the stock is reduced, there is evidence of stock rebuilding within a specified timeframe			
b	Rebuilding evaluation			
	Guidepost	Monitoring is in place to determine whether the rebuilding strategies are effective in rebuilding the stock within the specified timeframe.	There is evidence that the rebuilding strategies are rebuilding stocks, or it is likely based on simulation modeling, exploitation rates or previous performance that they will be able to rebuild the stock within the specified timeframe.	There is strong evidence that the rebuilding strategies are rebuilding stocks, or it is highly likely based on simulation modeling, exploitation rates or previous performance that they will be able to rebuild the stock within the specified timeframe.
	Met?	No stock rebuilding evaluations	(Y/N)	(Y/N)
Overall PI justification	<60 score for BMT No stock rebuilding strategy and no evaluations			
References	Wambiji et al 2018 / Fact sheets, need for update Hicks & McClanahan 2014 Tuda et al 2016			
			Likely PI Scoring Level	<60

Evaluation Table for PI 1.2.1 – Harvest strategy

PI 1.2.1	There is a robust and precautionary harvest strategy in place			
Scoring Issue	SG 60	SG 80	SG 100	
a	Harvest strategy design			
	Guidepost	The harvest strategy is expected to achieve stock management objectives reflected in PI 1.1.1 SG80.	The harvest strategy is responsive to the state of the stock and the elements of the harvest strategy work together towards achieving stock management objectives reflected in PI 1.1.1 SG80.	The harvest strategy is responsive to the state of the stock and is designed to achieve stock management objectives reflected in PI 1.1.1 SG80.
	Met?	No, strategy	(Y/N)	(Y/N)
b	Harvest strategy evaluation			
	Guidepost	The harvest strategy is likely to work based on prior experience or plausible argument.	The harvest strategy may not have been fully tested but evidence exists that it is achieving its objectives.	The performance of the harvest strategy has been fully evaluated and evidence exists to show that it is achieving its objectives including being clearly

PI 1.2.1	There is a robust and precautionary harvest strategy in place		
			able to maintain stocks at target levels.
Met?	No evaluation	(Y/N)	(Y/N)
c	Harvest strategy monitoring		
Guidepost	Monitoring is in place that is expected to determine whether the harvest strategy is working.		
Met?	None		
d	Harvest strategy review		
Guidepost			The harvest strategy is periodically reviewed and improved as necessary.
Met?			No, no strategy, no periodic reviews
e	Shark finning		
Guidepost	It is likely that shark finning is not taking place.	It is highly likely that shark finning is not taking place.	There is a high degree of certainty that shark finning is not taking place.
Met?	Not relevant	(Y/N/Not relevant)	(Y/N/Not relevant)
f	Review of alternative measures		
Guidepost	There has been a review of the potential effectiveness and practicality of alternative measures to minimize UoA-related mortality of unwanted catch of the target stock.	There is a regular review of the potential effectiveness and practicality of alternative measures to minimize UoA-related mortality of unwanted catch of the target stock and they are implemented as appropriate.	There is a biennial review of the potential effectiveness and practicality of alternative measures to minimize UoA-related mortality of unwanted catch of the target stock, and they are implemented, as appropriate.
Met?	Not relevant	(Y/N/Not relevant)	(Y/N/Not relevant)
Overall PI justification	No harvest strategy in place, no monitoring, no plans in place		
References	Wambiji et al 2018 / Fact sheets, need for update Hicks & McClanahan 2014 Tuda et al 2016		

Likely PI Scoring Level (<60, 60-79, ≥ 80)

<60

Evaluation Table for PI 1.2.2 – Harvest control rules and tools

PI 1.2.2	There are well defined and effective harvest control rules (HCRs) in place		
Scoring Issue	SG 60	SG 80	SG 100
a	HCRs design and application		
Guidepost	Generally understood HCRs are in place or available that are expected to reduce the exploitation rate as the point of recruitment impairment (PRI) is approached.	Well defined HCRs are in place that ensure that the exploitation rate is reduced as the PRI is approached, are expected to keep the stock fluctuating around a target level consistent with (or above) MSY, or for key LTL species a level consistent with ecosystem needs.	The HCRs are expected to keep the stock fluctuating at or above a target level consistent with MSY, or another more appropriate level taking into account the ecological role of the stock, most of the time.
Met?	None	(Y/N)	
b	HCRs robustness to uncertainty		
Guidepost		The HCRs are likely to be robust to the main uncertainties.	The HCRs take account of a wide range of uncertainties including the ecological role of the stock, and there is evidence that the HCRs are robust to the main uncertainties.
Met?		(Y/N)	(Y/N)
c	HCRs evaluation		
Guidepost	There is some evidence that tools used or available to implement HCRs are appropriate and effective in controlling exploitation.	Available evidence indicates that the tools in use are appropriate and effective in achieving the exploitation levels required under the HCRs.	Evidence clearly shows that the tools in use are effective in achieving the exploitation levels required under the HCRs.
Met?	None	(Y/N)	(Y/N)
Overall PI justification	No harvest control rules in place		
References	Wambiji et al 2018 / Fact sheets, need for update Hicks & McClanahan 2014 Tuda et al 2016		
	Likely PI Scoring Level (<60, 60-79, ≥ 80)		<60

Evaluation Table for PI 1.2.3 – Information and monitoring

PI 1.2.3		Relevant information is collected to support the harvest strategy		
Scoring Issue		SG 60	SG 80	SG 100
a	Range of information			
	Guidepost	Some relevant information related to stock structure, stock productivity and fleet composition is available to support the harvest strategy.	Sufficient relevant information related to stock structure, stock productivity, fleet composition and other data is available to support the harvest strategy.	A comprehensive range of information (on stock structure, stock productivity, fleet composition, stock abundance, UoA removals and other information such as environmental information), including some that may not be directly related to the current harvest strategy, is available.
	Met?	Yes, Information is fairly available	(Y/N)	(Y/N)
b	Monitoring			
	Guidepost	Stock abundance and UoA removals are monitored and at least one indicator is available and monitored with sufficient frequency to support the harvest control rule.	Stock abundance and UoA removals are regularly monitored at a level of accuracy and coverage consistent with the harvest control rule , and one or more indicators are available and monitored with sufficient frequency to support the harvest control rule.	All information required by the harvest control rule is monitored with high frequency and a high degree of certainty, and there is a good understanding of inherent uncertainties in the information [data] and the robustness of assessment and management to this uncertainty.
	Met?	(Y/N)	(Y/N)	(Y/N)
c	Comprehensiveness of information			
	Guidepost		Yes, there is good information on all other fishery removals from the stock.	
	Met?		Yes, fair data can be consolidated from the various gears targeting the siganid fisheries	
Overall PI justification		information available on biology, stock demography, gear-fleet, biomass estimates, fishing effort estimates, CPUEs, SSBs etc. but quality and quantity needs to be improved for the entire spatial expanse of the fishery; Good data available for Kwale, Mombasa, more work needed for north coast and entire coastline		
References		Hicks & McClanahan, Wambiji et al, KMFRI reports, SDF statistics		

PI 1.2.3	Relevant information is collected to support the harvest strategy	Likely PI Scoring Level (<60, 60-79, ≥80)	60-79
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Evaluation Table for PI 1.2.4 – Assessment of stock status

PI 1.2.4	There is an adequate assessment of the stock status		
Scoring Issue	SG 60	SG 80	SG 100
a	Appropriateness of assessment to stock under consideration		
	Guidepost		The assessment is appropriate for the stock and for the harvest control rule.
			The assessment takes into account the major features relevant to the biology of the species and the nature of the UoA.
	Met?		Yes, some data ok from KMFRI Tech reports, ref points available
			(Y/N)
b	Assessment approach		
	Guidepost		The assessment estimates stock status relative to generic reference points appropriate to the species category.
			The assessment estimates stock status relative to reference points that are appropriate to the stock and can be estimated.
	Met?	(Y/N)	Yes, estimates with specific reference points available
c	Uncertainty in the assessment		
	Guidepost		The assessment identifies major sources of uncertainty.
			The assessment takes uncertainty into account.
			The assessment takes into account uncertainty and is evaluating stock status relative to reference points in a probabilistic way.
	Met?	(Y/N)	(Y/N)
			Yes, where data lacks, assumptions and relative estimates calculated
d	Evaluation of assessment		
	Guidepost		
			The assessment has been tested and shown to be robust. Alternative hypotheses and assessment approaches have been rigorously explored.
	Met?		Not met
e	Peer review of assessment		

PI 1.2.4		There is an adequate assessment of the stock status		
	Guidepost		The assessment of stock status is subject to peer review.	The assessment has been internally and externally peer reviewed.
	Met?		(Y/N)	YES/ Internally/externally reviewed
Overall PI justification		<p>-Data on stock assessment is fairly adequate for <i>Siganus sp.</i> (Ref points available) for definition of some harvest control rule</p> <p>- Estimates with specific reference points available; MSY, SSB, F_{MSY}, E_{MSY}.</p> <p>- Where data lacks, assumptions & relative estimates have been calculated e.g. age data from length-at-age estimates, using L-A data from other fisheries</p> <p>- Assessment just at initial stages, not tested for robustness, alternative hypotheses and assessment approaches have not been rigorously explored</p> <p>- Internally/externally reviewed: SNAP, WWF, Stock assessment training</p>		
References		McClanahan, Samoilyls, melitas		
			Likely PI Scoring Level (<60, 60-79, ≥ 80)	≥ 80

Principle 2: Maintenance of the fishery ecosystem

Evaluation Table for PI 2.1.1 – Primary species outcome

PI 2.1.1		The UoA aims to maintain primary species above the PRI and does not hinder recovery of primary species if they are below the PRI.		
Scoring Issue		SG 60	SG 80	SG 100
a	Main primary species stock status			
	Guide post	Main primary species are likely to be above the PRI OR If the species is below the PRI, the UoA has measures in place that are expected to ensure that the UoA does not hinder recovery and rebuilding.	Main primary species are highly likely to be above the PRI OR If the species is below the PRI, there is either evidence of recovery or a demonstrably effective strategy in place between all MSC UoAs which categorize this species as main , to ensure that they collectively do not hinder recovery and rebuilding.	There is a high degree of certainty that main primary species are above the PRI and are fluctuating around a level consistent with MSY.
	Met?	No, the fishery has no primary species (def. in pg 102 of the MSC guide)	(Y/N)	(Y/N)
b	Minor primary species stock status			

PI 2.1.1		The UoA aims to maintain primary species above the PRI and does not hinder recovery of primary species if they are below the PRI.		
	Guide post			Minor primary species are highly likely to be above the PRI OR If below the PRI, there is evidence that the UoA does not hinder the recovery and rebuilding of minor primary species
	Met?			No, data lacking for the minor fisheries
Overall PI justification		Siganids are the target species, the rest fall under Secondary species as per MSC standard (Definition pg 102) incl. <i>Lethrinus</i> spp. which is occasionally higher in landings than the target species		
References		MSC reference guide, Wambiji et al., Hicks & McClanahan, Tuda et. al. etc.		
RBFRequired ? (✓/✗/)		X	Likely PI Scoring Level (<60, 60-79, ≥ 80)	<60

Evaluation Table for PI 2.1.2 – Primary species management strategy

PI 2.1.2		There is a strategy in place that is designed to maintain or to not hinder rebuilding of primary species, and the UoA regularly reviews and implements measures, as appropriate, to minimize the mortality of unwanted catch.		
Scoring Issue		SG 60	SG 80	SG 100
a	Management strategy in place			
	Guidepost	There are measures in place for the UoA, if necessary, that are expected to maintain or to not hinder rebuilding of the main primary species at/to levels which are likely to above the point where recruitment would be impaired.	There is a partial strategy in place for the UoA, if necessary, that is expected to maintain or to not hinder rebuilding of the main primary species at/to levels which are highly likely to be above the point where recruitment would be impaired.	There is a strategy in place for the UoA for managing main and minor primary species.
	Met?	No, species categorized as primary; only targets siganid species, and secondary species in the fishery as per the MCS definition	(Y/N)	(Y/N)
b	Management strategy evaluation			
	Guidepost	The measures are considered likely to	There is some objective basis for confidence that	Testing supports high confidence that the

PI 2.1.2	There is a strategy in place that is designed to maintain or to not hinder rebuilding of primary species, and the UoA regularly reviews and implements measures, as appropriate, to minimize the mortality of unwanted catch.			
		work, based on plausible argument (e.g., general experience, theory or comparison with similar fisheries/species).	the measures/partial strategy will work, based on some information directly about the fishery and/or species involved.	partial strategy/strategy will work, based on information directly about the fishery and/or species involved.
	Met?	No, no measures in place, no primary species	(Y/N)	(Y/N)
c	Management strategy implementation			
	Guidepost		There is some evidence that the measures/partial strategy is being implemented successfully .	There is clear evidence that the partial strategy/strategy is being implemented successfully and is achieving its overall objective as set out in scoring issue (a).
	Met?		No, no measures in place, no primary species	(Y/N)
d	Shark finning			
	Guidepost	It is likely that shark finning is not taking place.	It is highly likely that shark finning is not taking place.	There is a high degree of certainty that shark finning is not taking place.
	Met?	Not relevant	(Y/N/Not relevant)	(Y/N/Not relevant)
e	Review of alternative measures			
	Guidepost	There is a review of the potential effectiveness and practicality of alternative measures to minimize UoA-related mortality of unwanted catch of main primary species.	There is a regular review of the potential effectiveness and practicality of alternative measures to minimize UoA-related mortality of unwanted catch of main primary species and they are implemented as appropriate.	There is a biennial review of the potential effectiveness and practicality of alternative measures to minimize UoA-related mortality of unwanted catch of all primary species, and they are implemented, as appropriate.
	Met?	Not relevant	(Y/N/Not relevant)	(Y/N/Not relevant)
Overall PI justification	No primary species, all the rest are categorized as secondary because there are no existing management structures for the species			
References	MSC reference guide, Wambiji et al., Hicks & McClanahan, Tuda et al etc			
			Likely PI Scoring Level (<60, 60-79, ≥ 80)	<60

Evaluation Table for PI 2.1.3 – Primary species information

PI 2.1.3	Information on the nature and extent of primary species is adequate to determine the risk posed by the UoA and the effectiveness of the strategy to manage primary species			
Scoring Issue	SG 60	SG 80	SG 100	
a	Information adequacy for assessment of impact on main primary species			
Guidepost	Qualitative information is adequate to estimate the impact of the UoA on the main primary species with respect to status. OR If RBF is used to score PI 2.1.1 for the UoA: Qualitative information is adequate to estimate productivity and susceptibility attributes for main primary species.	Some quantitative information is available and is adequate to assess the impact of the UoA on the main primary species with respect to status. OR If RBF is used to score PI 2.1.1 for the UoA: Some quantitative information is adequate to assess productivity and susceptibility attributes for main primary species.	Quantitative information is available and is adequate to assess with a high degree of certainty the impact of the UoA on main primary species with respect to status.	
Met?	No, no species categorized as “Primary” under basket trap fishery	(Y/N)	(Y/N)	
b	Information adequacy for assessment of impact on minor primary species			
Guidepost			Some quantitative information is adequate to estimate the impact of the UoA on minor primary species with respect to status.	
Met?			No, fishery has no primary species category	
c	Information adequacy for management strategy			
Guidepost	Information is adequate to support measures to manage main primary species.	Information is adequate to support a partial strategy to manage main Primary species.	Information is adequate to support a strategy to manage all primary species, and evaluate with a high degree of certainty whether the strategy is achieving its objective.	
Met?	(Y/N)	(Y/N)	(Y/N)	

PI 2.1.3	Information on the nature and extent of primary species is adequate to determine the risk posed by the UoA and the effectiveness of the strategy to manage primary species
Overall PI justification	No scores, all species apart from the Target categorized as Secondary species
References	[List any references here]
	Likely PI Scoring Level (<60, 60-79, ≥ 80)
	60-79

Evaluation Table for PI 2.2.1 – Secondary species outcome

PI 2.2.1	The UoA aims to maintain secondary species above a biologically based limit and does not hinder recovery of secondary species if they are below a biological based limit.		
Scoring Issue	SG 60	SG 80	SG 100
a	Main secondary species stock status		
Guidepost	Main Secondary species are likely to be within biologically based limits. OR If below biologically based limits, there are measures in place expected to ensure that the UoA does not hinder recovery and rebuilding.	Main secondary species are highly likely to be above biologically based limits OR If below biologically based limits, there is either evidence of recovery or a demonstrably effective partial strategy in place such that the UoA does not hinder recovery and rebuilding. AND Where catches of a main secondary species outside of biological limits are considerable, there is either evidence of recovery or a, demonstrably effective strategy in place between those MSC UoAs that also have considerable catches of the species, to ensure that they collectively do not hinder recovery and rebuilding.	There is a high degree of certainty that main secondary species are within biologically based limits.
Met?	Yes; measures in place: CCA, LMAs, BMU mgt etc.	(Y/N)	(Y/N)
b	Minor secondary species stock status		

PI 2.2.1		The UoA aims to maintain secondary species above a biologically based limit and does not hinder recovery of secondary species if they are below a biological based limit.		
	Guidepost			Minor secondary species are highly likely to be above biologically based limits. OR If below biologically based limits', there is evidence that the UoA does not hinder the recovery and rebuilding of secondary species
	Met?			Yes: the basket trap fisheries doesn't hinder their recovery/rebuilding
Overall PI justification		Main Secondary species (<i>Lethrinus</i> spp., <i>Balistidae</i> spp., <i>Haemulids</i> spp., <i>Labrids</i> etc.) are likely to be within biologically based limits; measures in place (MPAs, CCA, CMAs, Conservancy etc.) expected to ensure that the UoA does not hinder recovery and rebuilding		
References		Hicks, C. C., & McClanahan, T. R. (2012). Assessing gear modifications needed to optimize yields in a heavily exploited, multi-species, sea grass and coral reef fishery. PLoS ONE, 7(5), 1–12. https://doi.org/10.1371/journal.pone.0036022 McClanahan, T. R. (2010). Effects of fisheries closures and gear restrictions on fishing income in a Kenyan Coral Reef. Conservation Biology, 24(6), 1519–1528. https://doi.org/10.1111/j.1523-1739.2010.01530.x		
RBF Required? (✓/✗/)	✓ RBF required	Likely PI Scoring Level (<60, 60-79, ≥ 80)	60-79	

Evaluation Table for PI 2.2.2 – Secondary species management strategy

PI 2.2.2		There is a strategy in place for managing secondary species that is designed to maintain or to not hinder rebuilding of secondary species and the UoA regularly reviews and implements measures, as appropriate, to minimize the mortality of unwanted catch.		
Scoring Issue		SG 60	SG 80	SG 100
a	Management strategy in place			
	Guidepost	There are measures in place, if necessary, which are expected to maintain or not hinder rebuilding of main secondary species at/to levels which are highly likely to be within biologically based limits or to ensure	There is a partial strategy in place, if necessary, for the UoA that is expected to maintain or not hinder rebuilding of main secondary species at/to levels which are highly likely to be within biologically based limits or to ensure that the	There is a strategy in place for the UoA for managing main and minor secondary species.

PI 2.2.2	There is a strategy in place for managing secondary species that is designed to maintain or to not hinder rebuilding of secondary species and the UoA regularly reviews and implements measures, as appropriate, to minimize the mortality of unwanted catch.		
	that the UoA does not hinder their recovery.	UoA does not hinder their recovery.	
	Met?	No, no strategies in place	(Y/N)
b	Management strategy evaluation		
	Guidepost	The measures are considered likely to work, based on plausible argument (e.g. general experience, theory or comparison with similar UoAs/species).	There is some objective basis for confidence that the measures/partial strategy will work, based on some information directly about the UoA and/or species involved.
	Met?	No measures in place, no evaluations	(Y/N)
c	Management strategy implementation		
	Guidepost		There is some evidence that the measures/partial strategy is being implemented successfully .
	Met?		(Y/N)
d	Shark finning		
	Guidepost	It is likely that shark finning is not taking place.	It is highly likely that shark finning is not taking place.
	Met?	No, shark species irrelevant in fishery	(Y/N/Not relevant)
e	Review of alternative measures to minimize mortality of unwanted catch [Scoring issue need not be scored if are no unwanted catches of secondary species]		

PI 2.2.2		There is a strategy in place for managing secondary species that is designed to maintain or to not hinder rebuilding of secondary species and the UoA regularly reviews and implements measures, as appropriate, to minimize the mortality of unwanted catch.		
	Guidepost	There is a review of the potential effectiveness and practicality of alternative measures to minimize UoA-related mortality of unwanted catch of main secondary species.	There is a regular review of the potential effectiveness and practicality of alternative measures to minimize UoA-related mortality of unwanted catch of main secondary species and they are implemented as appropriate.	There is a biennial review of the potential effectiveness and practicality of alternative measures to minimize UoA-related mortality of unwanted catch of all secondary species, and they are implemented, as appropriate.
	Met?	Yes = gated traps & others	(Y/N/Not relevant)	(Y/N/Not relevant)
Overall PI justification		No management strategies for secondary species however, experiments are in place to reduce capture of juveniles & low value species using gated traps, bigger mesh sizes, bigger trap sizes etc. shark species not relevant in this fishery		
References		Hicks, C. C., & McClanahan, T. R. (2012). Assessing gear modifications needed to optimize yields in a heavily exploited, multi-species, sea grass and coral reef fishery. PLoS ONE, 7(5), 1–12. https://doi.org/10.1371/journal.pone.0036022 McClanahan, T. R. (2010). Effects of fisheries closures and gear restrictions on fishing income in a Kenyan Coral Reef. Conservation Biology, 24(6), 1519–1528. https://doi.org/10.1111/j.1523-1739.2010.01530.x		

Likely PI Scoring Level (<60, 60-79, ≥ 80)	<60
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Evaluation Table for PI 2.2.3 – Secondary species information

PI 2.2.3		Information on the nature and amount of secondary species taken is adequate to determine the risk posed by the UoA and the effectiveness of the strategy to manage secondary species.		
Scoring Issue		SG 60	SG 80	SG 100
a	Information adequacy for assessment of impacts on main secondary species			
	Guidepost	Qualitative information is adequate to estimate the impact of the UoA on the main secondary species with respect to status. OR If RBF is used to score PI 2.2.1 for the UoA:	Some quantitative information is available and adequate to assess the impact of the UoA on main secondary species with respect to status. OR If RBF is used to score PI 2.2.1 for the UoA: Some quantitative information is adequate	Quantitative information is available and adequate to assess with a high degree of certainty the impact of the UoA on main secondary species with respect to status.

PI 2.2.3		Information on the nature and amount of secondary species taken is adequate to determine the risk posed by the UoA and the effectiveness of the strategy to manage secondary species.		
		Qualitative information is adequate to estimate productivity and susceptibility attributes for main secondary species.	to assess productivity and susceptibility attributes for main secondary species.	
	Met?	(Y/N)	Yes; a lot of info collected, and fairly good for stock assessment	(Y/N)
b		Information adequacy for assessment of impacts on minor secondary species		
	Guidepost			Some quantitative information is adequate to estimate the impact of the UoA on minor secondary species with respect to status
	Met?			Yes, information is available for assessment
c		Information adequacy for management strategy		
	Guidepost	Information is adequate to support measures to manage main secondary species.	Information is adequate to support a partial strategy to manage main secondary species.	Information is adequate to support a strategy to manage all secondary species, and evaluate with a high degree of certainty whether the strategy is achieving its objective .
	Met?	(Y/N)	Yes, info available	(Y/N)
Overall PI justification		Yes, adequate information is available to support partial strategies, with some established degree of management e.g. CCAs, CMAs, gated traps surveys, etc. although the partial strategies weren't specifically targeted to primary of secondary species		
References		<p>Hicks, C. C., & McClanahan, T. R. (2012). Assessing gear modifications needed to optimize yields in a heavily exploited, multi-species, sea grass and coral reef fishery. PLoS ONE, 7(5), 1–12. https://doi.org/10.1371/journal.pone.0036022</p> <p>McClanahan, T. R. (2010). Effects of fisheries closures and gear restrictions on fishing income in a Kenyan Coral Reef. Conservation Biology, 24(6), 1519–1528. https://doi.org/10.1111/j.1523-1739.2010.01530.x</p>		
			Likely PI Scoring Level (<60, 60-79, ≥ 80)	60-79

Evaluation Table for PI 2.3.1 – ETP species outcome

PI 2.3.1	The UoA meets national and international requirements for the protection of ETP species; The UoA does not hinder recovery of ETP species		
Scoring Issue	SG 60	SG 80	SG 100
a	Effects of the UoA on population/stock within national or international limits, where applicable [Scoring issue need not be scored if there are no national or international requirements that set limits for ETP species].		
Guidepost	Where national and/or international requirements set limits for ETP species, the effects of the UoA on the population/stock are known and likely to be within these limits.	Where national and/or international requirements set limits for ETP species, the combined effects of the MSC UoAs on the population/stock are known and highly likely to be within these limits.	Where national and/or international requirements set limits for ETP species, there is a high degree of certainty that the combined effects of the MSC UoAs are within these limits.
Met?	(Y/N/Not relevant)	(Y/N/Not relevant)	Yes, the basket trap fishery has little interaction with ETPs
b	Direct effects		
Guidepost	Known direct effects of the UoA are likely to not hinder recovery of ETP species.	Known direct effects of the UoA are highly likely to not hinder recovery of ETP species.	There is a high degree of confidence that there are no significant detrimental direct effects of the UoA on ETP species.
Met?	(Y/N)	(Y/N)	Yes, little gear interaction with ETPs
c	Indirect effects		
Guidepost		Indirect effects have been considered and are thought to be highly likely to not create unacceptable impacts.	There is a high degree of confidence that there are no significant detrimental indirect effects of the fishery on ETP species.
Met?		(Y/N)	Yes, minimal gear interaction with ETPs
Overall PI justification	Basket trap fisheries are fairly safe fishing gears set in sea grass beds and shallow reefs and being a static gear, with fixed gate for entry of target species, has minimal interactions with ETPs and other species bigger than the entry gates		
References	Hicks, C. C., & McClanahan, T. R. (2012). Assessing gear modifications needed to optimize yields in a heavily exploited, multi-species, sea grass and coral reef fishery. PLoS ONE, 7(5), 1–12. https://doi.org/10.1371/journal.pone.0036022 McClanahan, T. R. (2010). Effects of fisheries closures and gear restrictions on fishing income in a Kenyan Coral Reef. Conservation		

PI 2.3.1	The UoA meets national and international requirements for the protection of ETP species; The UoA does not hinder recovery of ETP species		
	Biology, 24(6), 1519–1528. https://doi.org/10.1111/j.1523-1739.2010.01530.x		
RBFRequired? (✓/✗/)	X	Likely PI Scoring Level (<60, 60-79, ≥ 80)	≥ 80

Evaluation Table for PI 2.3.2 – ETP species management strategy

PI 2.3.2	The UoA has in place precautionary management strategies designed to: <ul style="list-style-type: none"> • meet national and international requirements; • ensure the UoA does not hinder recovery of ETP species. Also, the UoA regularly reviews and implements measures, as appropriate, to minimize the mortality of ETP species.			
Scoring Issue	SG 60	SG 80	SG 100	
a	Management strategy in place (national and international requirements) [Scoring issue need not be scored if <u>there are no</u> requirements for protection or rebuilding provided through national ETP legislation or international agreements].			
Guidepost	There are measures in place that minimize the UoA-related mortality of ETP species, and are expected to be highly likely to achieve national and international requirements for the protection of ETP species.	There is a strategy in place for managing the UoA’s impact on ETP species, including measures to minimize mortality, which is designed to be highly likely to achieve national and international requirements for the protection of ETP species.	There is a comprehensive strategy in place for managing the UoA’s impact on ETP species, incl. measures to minimize mortality, which is designed to achieve above national and international requirements for the protection of ETP species.	
Met?	Not relevant	(Y/N/Not relevant)	(Y/N/Not relevant)	
b	Management strategy in place (alternative) [Scoring issue need not be scored if <u>there are</u> requirements for protection or rebuilding provided through national ETP legislation or international agreements].			
Guidepost	There are measures in place that are expected to ensure the UoA does not hinder the recovery of ETP species.	There is a strategy in place that is expected to ensure the UoA does not hinder the recovery of ETP species.	There is a comprehensive strategy in place for managing ETP species, to ensure the UoA does not hinder the recovery of ETP species	
Met?	Not relevant	(Y/N/Not relevant)	(Y/N/Not relevant)	
c	Management strategy evaluation			
Guidepost	The measures are considered likely to work, based on plausible argument (e.g., general experience, theory or comparison with	There is an objective basis for confidence that the measures/strategy will work, based on information directly about the fishery	The strategy/ comprehensive strategy is mainly based on information directly about the fishery and/or species involved, and a	

		similar fisheries/species).	and/or the species involved.	quantitative analysis supports high confidence that the strategy will work.
	Met?	No strategy, no evaluation	(Y/N)	(Y/N)
d	Management strategy implementation			
	Guide post		There is some evidence that the measures/strategy is being implemented successfully.	There is clear evidence that the strategy/comprehensive strategy is being implemented successfully and is achieving its objective as set out in scoring issue (a) or (b).
	Met?		No strategy, no measures, no evidence of implementation	(Y/N)
e	Review of alternative measures to minimize mortality of ETP species			
	Guidepost	There is a review of the potential effectiveness and practicality of alternative measures to minimize UoA-related mortality of ETP species.	There is a regular review of the potential effectiveness and practicality of alternative measures to minimize UoA-related mortality of ETP species and they are implemented as appropriate.	There is a biennial review of the potential effectiveness and practicality of alternative measures to minimize UoA-related mortality ETP species, and they are implemented, as appropriate.
	Met?	(Y/N)	(Y/N)	(Y/N)
Overall PI justification		No ETP strategies or plans related to Basket trap fisheries, hence there is no scoring for this attribute		
References		Not available		
			Likely PI Scoring Level (<60, 60-79, ≥ 80)	NO SCORE

Evaluation Table for PI 2.3.3 – ETP species information

PI 2.3.3	Relevant information is collected to support the management of UoA impacts on ETP species, including: <ul style="list-style-type: none"> • Information for the development of the management strategy; • Information to assess the effectiveness of the management strategy; and • Information to determine the outcome status of ETP species. 			
Scoring Issue	SG 60	SG 80	SG 100	
a	Information adequacy for assessment of impacts			
Guidepost	Qualitative information is adequate to estimate the UoA related mortality on ETP species. OR If RBF is used to score PI 2.3.1 for the UoA: Qualitative information is adequate to estimate productivity and susceptibility attributes for ETP species.	Some quantitative information is adequate to assess the UoA related mortality and impact and to determine whether the UoA may be a threat to protection and recovery of the ETP species. OR If RBF is used to score PI 2.3.1 for the UoA: Some quantitative information is adequate to assess productivity and susceptibility attributes for ETP species.	Quantitative information is available to assess with a high degree of certainty the magnitude of UoA-related impacts, mortalities and injuries and the consequences for the status of ETP species.	
Met?	(Y/N)	(Y/N)	YES, information is available assessments of possible interactions with ETPS	
b	Information adequacy for management strategy			
Guidepost	Information is adequate to support measures to manage the impacts on ETP species.	Information is adequate to measure trends and support a strategy to manage impacts on ETP species.	Information is adequate to support a comprehensive strategy to manage impacts, minimize mortality and injury of ETP species, and evaluate with a high degree of certainty whether a strategy is achieving its objectives.	
Met?	YES, info is available for the enactment of measures for ETPS management	(Y/N)	(Y/N)	
Overall PI justification	There is fairly some substantial information available for the likely interactions between ETPS and the basket trap fisheries, and is adequate for definition of a sound management strategy for any likely impacts			

<p>PI 2.3.3</p>	<p>Relevant information is collected to support the management of UoA impacts on ETP species, including:</p> <ul style="list-style-type: none"> • Information for the development of the management strategy; • Information to assess the effectiveness of the management strategy; and • Information to determine the outcome status of ETP species. 		
<p>References</p>	<p>Hicks, C. C., & McClanahan, T. R. (2012). Assessing gear modifications needed to optimize yields in a heavily exploited, multi-species, sea grass and coral reef fishery. PLoS ONE, 7(5), 1–12. https://doi.org/10.1371/journal.pone.0036022</p> <p>McClanahan, T. R. (2010). Effects of fisheries closures and gear restrictions on fishing income in a Kenyan Coral Reef. Conservation Biology, 24(6), 1519–1528. https://doi.org/10.1111/j.1523-1739.2010.01530.x</p>		
<table border="1" style="width: 100%;"> <tr> <td style="width: 60%; text-align: center;">Likely PI Scoring Level (<60, 60-79, ≥ 80)</td> <td style="width: 40%; text-align: center; background-color: #FFD700;">60-79</td> </tr> </table>		Likely PI Scoring Level (<60, 60-79, ≥ 80)	60-79
Likely PI Scoring Level (<60, 60-79, ≥ 80)	60-79		

Evaluation Table for PI 2.4.1 – Habitats outcome

<p>PI 2.4.1</p>	<p>The UoA does not cause serious or irreversible harm to habitat structure and function, considered on the basis of the area covered by the governance body(s) responsible for fisheries management in the area(s) where the UoA operates.</p>		
<p>Scoring Issue</p>	<p>SG 60</p>	<p>SG 80</p>	<p>SG 100</p>
<p>a</p>	<p>Commonly encountered habitat status</p>		
<p>Guidepost</p>	<p>The UoA is unlikely to reduce structure and function of the commonly encountered habitats to a point where there would be serious or irreversible harm.</p>	<p>The UoA is highly unlikely to reduce structure and function of the commonly encountered habitats to a point where there would be serious or irreversible harm.</p>	<p>There is evidence that the UoA is highly unlikely to reduce structure and function of the commonly encountered habitats to a point where there would be serious or irreversible harm.</p>
<p>Met?</p>	<p>(Y/N)</p>	<p>YES, Highly unlikely but depending on operations, the trap operations might destroy corals, and other critical sea grass habitats</p>	<p>(Y/N)</p>
<p>b</p>	<p>Vulnerable Marine Ecosystems (VME) habitat status</p>		
<p>[Scoring issue need not be scored if there are no VMEs].</p>			
<p>Guidepost</p>	<p>The UoA is unlikely to reduce structure and function of the VME habitats to a point where there would be serious or irreversible harm.</p>	<p>The UoA is highly unlikely to reduce structure and function of the VME habitats to a point where there would be serious or irreversible harm.</p>	<p>There is evidence that the UoA is highly unlikely to reduce structure and function of the VME habitats to a point where there would be serious or irreversible harm.</p>

PI 2.4.1		The UoA does not cause serious or irreversible harm to habitat structure and function, considered on the basis of the area covered by the governance body(s) responsible for fisheries management in the area(s) where the UoA operates.		
	Met?	YES, It's unlikely, but might destroy corals esp. on the few coral heads etc. depending operations and use of corals to sink the basket traps	(Y/N/Not relevant)	(Y/N/Not relevant)
c	Minor habitat status			
	Guidepost			There is evidence that the UoA is highly unlikely to reduce structure and function of the minor habitats to a point where there would be serious or irreversible harm.
	Met?			YES, Little impacts on other minor habitats
Overall PI justification		-Highly unlikely but depending on operations, the trap operations might destroy corals, and other critical seagrass habitats - It's unlikely, but might destroy corals esp. on the few coral heads etc. depending operations and use of corals to sink the basket traps - Little impacts on other minor habitats		
References		Mwaura report on ESIA for upscaling of gated traps;		
RBF Required? (✓/✗/)		X	Likely PI Scoring Level (<60, 60-79, ≥ 80)	60-79

Evaluation Table for PI 2.4.2 – Habitats management strategy

PI 2.4.2		There is a strategy in place that is designed to ensure the UoA does not pose a risk of serious or irreversible harm to the habitats.		
Scoring Issue		SG 60	SG 80	SG 100
a	Management strategy in place			
	Guidepost	There are measures in place, if necessary, that are expected to achieve the Habitat Outcome 80 level of performance.	There is a partial strategy in place, if necessary, that is expected to achieve the Habitat Outcome 80 level of performance or above.	There is a strategy in place for managing the impact of all MSC UoAs/non-MSC fisheries on habitats.
	Met?	(Y/N)	(Y/N)	YES; coral reef & Sea grass Ecosystems Conservation Strategy 2015-2019, the Co-mgt plans, CCAs, MPAs
b	Management strategy evaluation			

PI 2.4.2		There is a strategy in place that is designed to ensure the UoA does not pose a risk of serious or irreversible harm to the habitats.		
	Guidepost	The measures are considered likely to work, based on plausible argument (e.g. general experience, theory or comparison with similar UoAs/habitats).	There is some objective basis for confidence that the measures/partial strategy will work, based on information directly about the UoA and/or habitats involved.	Testing supports high confidence that the partial strategy/strategy will work, based on information directly about the UoA and/or habitats involved.
	Met?	YES, no specific considerations have been made for Basket trap fisheries	(Y/N)	(Y/N)
c Management strategy implementation				
	Guidepost		There is some quantitative evidence that the measures/partial strategy is being implemented successfully.	There is clear quantitative evidence that the partial strategy/strategy is being implemented successfully and is achieving its objective, as outlined in scoring issue (a).
	Met?		YES, within MPAs, CCAs, Co-mgt areas, evidence from studies & in situ monitoring programmes by WCS, CORDIO etc.	(Y/N)
d Compliance with management requirements and other MSC UoAs'/non-MSC fisheries' measures to protect VMEs [Scoring issue need not be scored if there are no VMEs].				
	Guidepost	There is qualitative evidence that the UoA complies with its management requirements to protect VMEs.	There is some quantitative evidence that the UoA complies with both its management requirements and with protection measures afforded to VMEs by other MSC UoAs / non-MSC fisheries, where relevant.	There is clear quantitative evidence that the UoA complies with both its management requirements and with protection measures afforded to VMEs by other MSC UoAs/non-MSC fisheries, where relevant.
	Met?	YES, general compliance with protection of VMEs	(Y/N/Not relevant)	(Y/N/Not relevant)
Overall PI justification		- Yes; coral reef & Seagrass Ecosystems Conservation Strategy 2015-2019, the Co-mgt plans, CCAs, MPAs		

PI 2.4.2	There is a strategy in place that is designed to ensure the UoA does not pose a risk of serious or irreversible harm to the habitats.
	- Yes, general compliance with protection of VMEs with the Seagrass Net project which undertakes investigation and documentation of the status of seagrass resources in WIO; the WIO seagrass network etc
References	Coral Reef and Seagrass Ecosystem Conservation Strategy, Reef Check; WIO Seagrass network etc.
	Likely PI Scoring Level (<60, 60-79, ≥ 80)
	60-79

Evaluation Table for PI 2.4.3 – Habitats information

PI 2.4.3	Information is adequate to determine the risk posed to the habitat by the UoA and the effectiveness of the strategy to manage impacts on the habitat.		
Scoring Issue	SG 60	SG 80	SG 100
a	Information quality		
Guidepost	The types and distribution of the main habitats are broadly understood . OR If CSA is used to score PI 2.4.1 for the UoA: Qualitative information is adequate to estimate the types and distribution of the main habitats.	The nature, distribution and vulnerability of the main habitats in the UoA area are known at a level of detail relevant to the scale and intensity of the UoA. OR If CSA is used to score PI 2.4.1 for the UoA: Some quantitative information is available and is adequate to estimate the types and distribution of the main habitats.	The distribution of all habitats is known over their range, with particular attention to the occurrence of vulnerable habitats.
Met?	(Y/N)	(Y/N)	YES, major habitats well understood including sea grass beds, reef ecosystems; a lot of info from McClanahan & team, CORDIO, KMFRI, SDF, Universities
b	Information adequacy for assessment of impacts		
Guidepost	Information is adequate to broadly understand the nature of the main impacts of gear use on the main habitats, including spatial overlap of habitat with fishing gear.	Information is adequate to allow for identification of the main impacts of the UoA on the main habitats, and there is reliable information on the spatial extent of interaction and on the	The physical impacts of the gear on all habitats have been quantified fully.

PI 2.4.3		Information is adequate to determine the risk posed to the habitat by the UoA and the effectiveness of the strategy to manage impacts on the habitat.		
		OR If CSA is used to score PI 2.4.1 for the UoA: Qualitative information is adequate to estimate the consequence and spatial attributes of the main habitats.	timing and location of use of the fishing gear. OR If CSA is used to score PI 2.4.1 for the UoA: Some quantitative information is available and is adequate to estimate the consequence and spatial attributes of the main habitats.	
	Met?	(Y/N)	YES, a lot of information is available for assessment of the impacts of the UoAs on habitats	(Y/N)
c	Monitoring			
	Guide post		Adequate information continues to be collected to detect any increase in risk to the main habitats.	Changes in habitat distributions over time are measured.
	Met?		(Y/N)	YES, considering the long monitoring by WCS, CORDIO, WWF, KMFRI,
Overall PI justification		- Yes, major habitats well understood including sea grass beds, reef ecosystems; a lot of info from McClanahan & team, CORDIO, KMFRI, SDF, Universities -Yes, a lot of information is available for assessment of the impacts of the UoAs on habitats -Yes, considering the long monitoring by WCS, CORDIO, WWF, KMFRI,		
References		WCS, CORDIO, WWF, KMFRI docs		

Likely PI Scoring Level (<60, 60-79, ≥ 80)	≥ 80
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Evaluation Table for PI 2.5.1 – Ecosystem outcome

PI 2.5.1	The UoA does not cause serious or irreversible harm to the key elements of ecosystem structure and function.		
Scoring Issue	SG 60	SG 80	SG 100
a	Ecosystem status		
Guidepost	The UoA is unlikely to disrupt the key elements underlying ecosystem structure and function to a point where there would be a serious or irreversible harm.	The UoA is highly unlikely to disrupt the key elements underlying ecosystem structure and function to a point where there would be a serious or irreversible harm.	There is evidence that the UoA is highly unlikely to disrupt the key elements underlying ecosystem structure and function to a point where there would be a serious or irreversible harm.
Met?	(Y/N/Partial)	(Y/N/Partial)	Partial evidence is available
Overall PI justification	-Partial, and use within sea grass beds and other less vulnerable habitats show no evidence for Basket trap impacts on such areas, however use on corals might cause serious harm/irreversible; furthermore use of grass (mwani) as bait also destroys the sea grass ecosystems		
References	WCS, CORDIO, WWF, KMFRI docs		
RBFRequired? (✓/✗/)	X	Likely PI Scoring Level (<60, 60-79, ≥ 80)	≥ 80

Evaluation Table for PI 2.5.2 – Ecosystem management strategy

PI 2.5.2	There are measures in place to ensure the UoA does not pose a risk of serious or irreversible harm to ecosystem structure and function.		
Scoring Issue	SG 60	SG 80	SG 100
a	Management strategy in place		
Guidepost	There are measures in place, if necessary which take into account the potential impacts of the fishery on key elements of the ecosystem.	There is a partial strategy in place, if necessary, which takes into account available information and is expected to restrain impacts of the UoA on the ecosystem so as to achieve the Ecosystem Outcome 80 level of performance.	There is a strategy that consists of a plan , in place which contains measures to address all main impacts of the UoA on the ecosystem, and at least some of these measures are in place.
Met?	YES, no strategy but measures are in place	(Y/N)	(Y/N)
b	Management strategy evaluation		
Guidepost	The measures are considered likely to work, based on plausible argument (e.g., general experience, theory	There is some objective basis for confidence that the measures/partial strategy will work, based on some information directly	Testing supports high confidence that the partial strategy/strategy will work, based on information directly

PI 2.5.2		There are measures in place to ensure the UoA does not pose a risk of serious or irreversible harm to ecosystem structure and function.		
		or comparison with similar fisheries/ ecosystems).	about the UoA and/or the ecosystem involved	about the UoA and/or ecosystem involved
	Met?	No, evaluations in place	(Y/N)	(Y/N)
c	Management strategy implementation			
	Guidepost		There is some evidence that the measures/ partial strategy is being implemented successfully .	There is clear evidence that the partial strategy/strategy is being implemented successfully and is achieving its objective as set out in scoring issue (a) .
	Met?		YES, Co-managements, CCAs, CMAs	(Y/N)
Overall PI justification		Yes, no strategy but measures are in place ; No evaluations in place; evidence of successful implementation of measures evident; Co-managements, CCAs, CMAs		
References		WCS, CORDIO, WWF, KMFRI docs		
			Likely PI Scoring Level (<60, 60-79, ≥ 80)	60-79

Evaluation Table for PI 2.5.3 – Ecosystem information

PI 2.5.3		There is adequate knowledge of the impacts of the UoA on the ecosystem.		
Scoring Issue		SG 60	SG 80	SG 100
a	Information quality			
	Guidepost	Information is adequate to identify the key elements of the ecosystem.	Information is adequate to broadly understand the key elements of the ecosystem.	
	Met?	(Y/N)	YES, Impacts have been documented in various studies (McClanahan et al.) & are broadly understood	
b	Investigation of UoA impacts			
	Guidepost	Main impacts of the UoA on these key ecosystem elements can be inferred from existing information, but have not been investigated in detail .	Main impacts of the UoA on these key ecosystem elements can be inferred from existing information, and some have been investigated in detail .	Main interactions between the UoA and these ecosystem elements can be inferred from existing information, and have been investigated in detail .

PI 2.5.3		There is adequate knowledge of the impacts of the UoA on the ecosystem.		
	Met?	(Y/N)	YES, Impacts generally assessed and some can be inferred in detail from specific studies	(Y/N)
c	Understanding of component functions			
	Guidepost		The main functions of the components (i.e., P1 target species, primary, secondary and ETP species and Habitats) in the ecosystem are known .	The impacts of the UoA on P1 target species, primary, secondary and ETP species and Habitats are identified and the main functions of these components in the ecosystem are understood .
	Met?		YES, Generally studied, main functions are fairly understood on all components; stocks, ecosystems & habitats	(Y/N)
d	Information relevance			
	Guidepost		Adequate information is available on the impacts of the UoA on these components to allow some of the main consequences for the ecosystem to be inferred.	Adequate information is available on the impacts of the UoA on the components and elements to allow the main consequences for the ecosystem to be inferred.
	Met?		YES, Generally well-studied & understood, impacts on components understood, impacts can be inferred	(Y/N)
e	Monitoring			
	Guidepost		Adequate data continue to be collected to detect any increase in risk level.	Information is adequate to support the development of strategies to manage ecosystem impacts.
	Met?		(Y/N)	YES, A lot of information available for definition of strategies for ecosystem impacts managements
Overall PI justification		-Impacts have been documented in various studies (McClanahan et al.) & are broadly understood -Impacts generally assessed and some can be inferred in detail from specific studies - Generally studied, main functions are fairly understood on all components; stocks, ecosystems & habitats		

PI 2.5.3	There is adequate knowledge of the impacts of the UoA on the ecosystem.
	-Generally well-studied & understood, impacts on components understood, impacts can be inferred -A lot of information available for definition of strategies for ecosystem impacts managements
References	Hicks, C. C., & McClanahan, T. R. (2012). Assessing gear modifications needed to optimize yields in a heavily exploited, multi-species, sea grass and coral reef fishery. PLoS ONE, 7(5), 1–12. https://doi.org/10.1371/journal.pone.0036022 McClanahan, T. R. (2010). Effects of fisheries closures and gear restrictions on fishing income in a Kenyan Coral Reef. Conservation Biology, 24(6), 1519–1528. https://doi.org/10.1111/j.1523-1739.2010.01530.x
	Likely PI Scoring Level (<60, 60-79, ≥ 80)
	≥ 80

Principle 3: Effective and responsible management

Evaluation Table for PI 3.1.1 – Legal and/or customary framework

PI 3.1.1	The management system exists within an appropriate legal and/or customary framework which ensures that it: <ul style="list-style-type: none"> • Is capable of delivering sustainability in the UoA(s); and • Observes the legal rights created explicitly or established by custom of people dependent on fishing for food or livelihood; and • Incorporates an appropriate dispute resolution framework. 		
Scoring Issue	SG 60	SG 80	SG 100
a	Compatibility of laws or standards with effective management		
Guide post	There is an effective national legal system and a framework for cooperation with other parties, where necessary, to deliver management outcomes consistent with MSC Principles 1 and 2	There is an effective national legal system and organised and effective cooperation with other parties, where necessary, to deliver management outcomes consistent with MSC Principles 1 and 2.	There is an effective national legal system and binding procedures governing cooperation with other parties which delivers management outcomes consistent with MSC Principles 1 and 2.
Met?	(Y/N)	(Y/N)	YES, Fisheries law in place, BMU regulations, ICZM framework, Kenya constitution of Kenya 2010; Wildlife Act, EMCA etc
b	Resolution of disputes		
Guidepost	The management system incorporates or is subject by law to a mechanism for	The management system incorporates or is subject by law to a transparent mechanism	The management system incorporates or is subject by law to a transparent mechanism

<p>PI 3.1.1</p>	<p>The management system exists within an appropriate legal and/or customary framework which ensures that it:</p> <ul style="list-style-type: none"> • Is capable of delivering sustainability in the UoA(s); and • Observes the legal rights created explicitly or established by custom of people dependent on fishing for food or livelihood; and • Incorporates an appropriate dispute resolution framework. 		
	<p>the resolution of legal disputes arising within the system.</p>	<p>for the resolution of legal disputes which is considered to be effective in dealing with most issues and that is appropriate to the context of the UoA.</p>	<p>for the resolution of legal disputes that is appropriate to the context of the fishery and has been tested and proven to be effective.</p>
<p>Met?</p>	<p>(Y/N)</p>	<p>YES, the legal systems are in place from BMU, co-mgt, Fisheries Act etc. but some flaws exist in the implementation etc</p>	<p>(Y/N)</p>
<p>c</p>	<p>Respect for rights</p>		
<p>Guidepost</p>	<p>The management system has a mechanism to generally respect the legal rights created explicitly or established by custom of people dependent on fishing for food or livelihood in a manner consistent with the objectives of MSC Principles 1 and 2.</p>	<p>The management system has a mechanism to observe the legal rights created explicitly or established by custom of people dependent on fishing for food or livelihood in a manner consistent with the objectives of MSC Principles 1 and 2.</p>	<p>The management system has a mechanism to formally commit to the legal rights created explicitly or established by custom of people dependent on fishing for food and livelihood in a manner consistent with the objectives of MSC Principles 1 and 2.</p>
<p>Met?</p>	<p>(Y/N)</p>	<p>(Y/N)</p>	<p>YES, BMUs regulations show clear mandate to commit legal rights to resource users etc</p>
<p>Overall PI justification</p>	<p>-Fisheries law in place, BMU regulations, ICZM framework, Kenya constitution of Kenya 2010; Wildlife Act, EMCA etc -The legal systems are in place from BMU, co-mgt, Fisheries Act etc. but some flaws exist in the implementation etc -BMUs regulations show clear mandate to commit legal rights to resource users etc.</p>		
<p>References</p>	<p>Fisheries Management and Development Act 2016; ICZM framework; Kenya Constitution; EMCA act 1999; Wildlife Act</p>		
<p>Likely PI Scoring Level (<60, 60-79, ≥ 80)</p>		<p>≥ 80</p>	

Evaluation Table for PI 3.1.2 – Consultation, roles and responsibilities

PI 3.1.2	The management system has effective consultation processes that are open to interested and affected parties. The roles and responsibilities of Organizations and individuals who are involved in the management process are clear and understood by all relevant parties		
Scoring Issue	SG 60	SG 80	SG 100
a	Roles and responsibilities		
Guidepost	Organizations and individuals involved in the management process have been identified. Functions, roles and responsibilities are generally understood .	Organizations and individuals involved in the management process have been identified. Functions, roles and responsibilities are explicitly defined and well understood for key areas of responsibility and interaction.	Organizations and individuals involved in the management process have been identified. Functions, roles and responsibilities are explicitly defined and well understood for all areas of responsibility and interaction.
Met?	(Y/N)	YES, Generally explicitly defined & well understood for key areas of responsibility & interaction but overlaps exist in the legal framework e.g. Wildlife Act for ETPs, EMCA for environmental issues etc.	(Y/N)
b	Consultation processes		
Guidepost	The management system includes consultation processes that obtain relevant information from the main affected parties, including local knowledge, to inform the management system.	The management system includes consultation processes that regularly seek and accept relevant information, including local knowledge. The management system demonstrates consideration of the information obtained.	The management system includes consultation processes that regularly seek and accept relevant information, including local knowledge. The management system demonstrates consideration of the information and explains how it is used or not used .
Met?	YES, Consultation processes are in place but not regular based on time frames, to inform management system	(Y/N)	(Y/N)
c	Participation		

PI 3.1.2		The management system has effective consultation processes that are open to interested and affected parties. The roles and responsibilities of Organizations and individuals who are involved in the management process are clear and understood by all relevant parties		
	Guidepost		The consultation process provides opportunity for all interested and affected parties to be involved.	The consultation process provides opportunity and encouragement for all interested and affected parties to be involved, and facilitates their effective engagement.
	Met?		(Y/N)	YES, Consultations are encouraged, opportunities provided, and facilitation for BMUs, Stakeholders etc. given wherever opportunity arises
Overall PI justification		<p>-Generally explicitly defined & well understood for key areas of responsibility & interaction but overlaps exist in the legal framework e.g. Wildlife Act for ETPs, EMCA for environmental issues etc.</p> <p>-Consultation processes are in place but not regular based on time frames, to inform management system</p> <p>-Consultations are encouraged, opportunities provided, and facilitation for BMUs, Stakeholders etc. given wherever opportunity arises</p>		
References		Fisheries Management and Development Act 2016; ICZM framework; Kenya Constitution; EMCA act 1999; Wildlife Act		
			Likely PI Scoring Level (<60, 60-79, ≥ 80)	60-79

Evaluation Table for PI 3.1.3 – Long term objectives

PI 3.1.3		The management policy has clear long-term objectives to guide decision-making that are consistent with MSC fisheries standard, and incorporates the precautionary approach.		
Scoring Issue		SG 60	SG 80	SG 100
a	Objectives			
	Guide post	Long-term objectives to guide decision-making, consistent with the MSC fisheries standard and the precautionary approach, are implicit within management policy.	Clear long-term objectives that guide decision-making, consistent with MSC fisheries standard and the precautionary approach are explicit within management policy.	Clear long-term objectives that guide decision-making, consistent with MSC fisheries standard and the precautionary approach, are explicit within and required by management policy.
	Met?	(Y/N/Partial)	(Y/N/Partial)	YES, Fisheries Act: calls for EAF approach to management at no less standards than defined

PI 3.1.3	The management policy has clear long-term objectives to guide decision-making that are consistent with MSC fisheries standard, and incorporates the precautionary approach.		
			in international agreements; IOTC, UNCLOS, IPOAs etc.
Overall PI justification	-Fisheries Act: calls for EAF approach to management at no less standards than defined in international agreements; IOTC, UNCLOS, IPOAs etc.		
References	Fisheries Management and Development Act 2016		
		Likely PI Scoring Level (<60, 60-79, ≥ 80)	≥ 80

Evaluation Table for PI 3.2.1 Fishery-specific objectives

PI 3.2.1	The fishery-specific management system has clear, specific objectives designed to achieve the outcomes expressed by MSC’s Principles 1 and 2.			
Scoring Issue	SG 60	SG 80	SG 100	
a	Objectives			
	Guide post	Objectives , which are broadly consistent with achieving the outcomes expressed by MSC’s Principles 1 and 2, are implicit within the fishery-specific management system.	Short and long-term objectives , which are consistent with achieving the outcomes expressed by MSC’s Principles 1 and 2, are explicit within the fishery-specific management system.	Well defined and measurable short and long-term objectives , which are demonstrably consistent with achieving the outcomes expressed by MSC’s Principles 1 and 2, are explicit within the fishery-specific management system.
	Met?	No, fishery specific objectives outlined; no management plan existing etc.	(Y/N/Partial)	(Y/N/Partial)
Overall PI justification	-No fishery specific objectives outlined; no management plan existing etc.			
References	Not available			
		Likely PI Scoring Level (<60, 60-79, ≥ 80)	<60	

Evaluation Table for PI 3.2.2 – Decision-making processes

PI 3.2.2	The fishery-specific management system includes effective decision-making processes that result in measures and strategies to achieve the objectives, and has an appropriate approach to actual disputes in the fishery.			
Scoring Issue	SG 60	SG 80	SG 100	
a	Decision-making processes			
Guide post	There are some decision-making processes in place that result in measures and strategies to achieve the fishery-specific objectives.	There are established decision-making processes that result in measures and strategies to achieve the fishery-specific objectives.		
Met?	YES, BMU regulations and decision making structures, the EAF approach which has been streamlined and incorporated in management	(Y/N)		
b	Responsiveness of decision-making processes			
Guide post	Decision-making processes respond to serious issues identified in relevant research, monitoring, evaluation and consultation, in a transparent, timely & adaptive manner and take some account of the wider implications of decisions.	Decision-making processes respond to serious and other important issues identified in relevant research, monitoring, evaluation and consultation, in a transparent, timely and adaptive manner and take account of the wider implications of decisions.	Decision-making processes respond to all issues identified in relevant research, monitoring, evaluation and consultation, in a transparent, timely and adaptive manner and take account of the wider implications of decisions.	
Met?	YES, but responds only to serious issues esp. with regards to fisheries, ecosystems, governance etc.	(Y/N)	(Y/N)	
c	Use of precautionary approach			
Guide post		Decision-making processes use the precautionary approach and are based on best available information.		
Met?		Yes, EAF approach well streamlined and incorporated in management		
d	Accountability and transparency of management system and decision-making process			

PI 3.2.2		The fishery-specific management system includes effective decision-making processes that result in measures and strategies to achieve the objectives, and has an appropriate approach to actual disputes in the fishery.		
	Guide post	Some information on the fishery's performance and management action is generally available on request to stakeholders.	Information on the fishery's performance and management action is available on request, and explanations are provided for any actions or lack of action associated with findings and relevant recommendations emerging from research, monitoring, evaluation and review activity.	Formal reporting to all interested stakeholders provides comprehensive information on the fishery's performance and management actions and describes how the management system responded to findings and relevant recommendations emerging from research, monitoring, evaluation and review activity.
	Met?	(Y/N)	YES, information on the fishery's performance & management action is available on request, with recommendations from research, M&E etc.	(Y/N)
e	Approach to disputes			
	Guide post	Although the management authority or fishery may be subject to continuing court challenges, it is not indicating a disrespect or defiance of the law by repeatedly violating the same law or regulation necessary for the sustainability for the fishery.	The management system or fishery is attempting to comply in a timely fashion with judicial decisions arising from any legal challenges.	The management system or fishery acts proactively to avoid legal disputes or rapidly implements judicial decisions arising from legal challenges.
	Met?	(Y/N)	YES, a lot of effort has been put into dispute resolution, attempts to comply are evident by the management	(Y/N)
Overall PI justification		<ul style="list-style-type: none"> -BMU regulations and decision making structures, the EAF approach which has been streamlined and incorporated in management -Responds only to serious issues esp. with regards to fisheries, ecosystems, governance etc. -EAF approach well streamlined and incorporated in management -Information on the fishery's performance & management action is available on request, with recommendations from research, M&E etc. -A lot of effort has been put into dispute resolution, attempts to comply are evident by the management 		
References		BMU regulations 2007; Fisheries Management and Development Act 2016		

PI 3.2.2	The fishery-specific management system includes effective decision-making processes that result in measures and strategies to achieve the objectives, and has an appropriate approach to actual disputes in the fishery.	Likely PI Scoring Level (<60, 60-79, ≥ 80)	60-79
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Evaluation Table for PI 3.2.3 – Compliance and enforcement

PI 3.2.3	Monitoring, control and surveillance mechanisms ensure the management measures in the fishery are enforced and complied with.		
Scoring Issue	SG 60	SG 80	SG 100
a	MCS implementation		
Guide post	Monitoring, control and surveillance mechanisms exist, and are implemented in the fishery and there is a reasonable expectation that they are effective.	A monitoring, control and surveillance system has been implemented in the fishery and has demonstrated an ability to enforce relevant management measures, strategies and/or rules.	A comprehensive monitoring, control and surveillance system has been implemented in the fishery and has demonstrated a consistent ability to enforce relevant management measures, strategies and/or rules.
Met?	YES, MCS mechanisms generally in place, occasionally implemented, some degree of effectiveness is evident	(Y/N)	(Y/N)
b	Sanctions		
Guide post	Sanctions to deal with non-compliance exist and there is some evidence that they are applied.	Sanctions to deal with non-compliance exist, are consistently applied and thought to provide effective deterrence.	Sanctions to deal with non-compliance exist, are consistently applied and demonstrably provide effective deterrence.
Met?	YES, General sanctions exist in Fisheries Act, BMU by laws, not specific to basket trap fisheries, the regulations are clear, but enforcement is still weak with little evidence available for sanctions etc	(Y/N)	(Y/N)
c	Compliance		
Guide post	Fishers are generally thought to comply with the management system for the fishery under assessment, including, when required,	Some evidence exists to demonstrate fishers comply with the management system under assessment, including, when	There is a high degree of confidence that fishers comply with the management system under assessment, including, providing

PI 3.2.3		Monitoring, control and surveillance mechanisms ensure the management measures in the fishery are enforced and complied with.		
		providing information of importance to the effective management of the fishery.	required, providing information of importance to the effective management of the fishery.	information of importance to the effective management of the fishery.
	Met?	(Y/N)	YES, generally thought to comply, but no evidence exists to show compliance, information provision etc., hence there is need to develop a comprehensive MCS system	(Y/N)
d	Systematic non-compliance			
	Guide post		There is no evidence of systematic non-compliance.	
	Met?		YES, there is no evidence of non-compliance, and generally, the fishers comply with legislation, licensing etc.	
Overall PI justification		<p>-MCS mechanisms generally in place, occasionally implemented, some degree of effectiveness is evident</p> <p>-General sanctions exist in Fisheries Act, BMU by laws, not specific to basket trap fisheries, the regulations are clear, but enforcement is still weak with little evidence available for sanctions etc.</p> <p>-Generally thought to comply, but no evidence exists to show compliance, information provision etc., hence there is need to develop a comprehensive MCS system</p> <p>-No evidence of no compliance, and generally, the fishers comply with legislation, licensing etc.</p>		
References		BMU regulations 2007; stakeholder consultations		
			Likely PI Scoring Level (<60, 60-79, ≥ 80)	60-79

Evaluation Table for PI 3.2.4 – Monitoring and management performance evaluation

PI 3.2.4	There is a system of monitoring and evaluating the performance of the fishery-specific management system against its objectives. There is effective and timely review of the fishery-specific management system.		
Scoring Issue	SG 60	SG 80	SG 100
a	Evaluation coverage		
Guide post	There are mechanisms in place to evaluate some parts of the fishery-specific management system.	There are mechanisms in place to evaluate key parts of the fishery-specific management system	There are mechanisms in place to evaluate all parts of the fishery-specific management system.
Met?	NO, and some aspects need redress e.g. by-catch, gated traps approach, bait issues, conflicts with other fisheries, effort etc.	(Y/N)	(Y/N)
b	Internal and/or external review		
Guide post	The fishery-specific management system is subject to occasional internal review.	The fishery-specific management system is subject to regular internal and occasional external review.	The fishery-specific management system is subject to regular internal and external review.
Met?	NO, but some occasional assessments done, esp. with ref to research and conflicts resolution with other fisheries, bait issues etc.	(Y/N)	(Y/N)
Overall PI justification	-Some aspects e.g. by-catch, gated traps approach, bait issues, conflicts with other fisheries, effort etc -Some occasional assessments done, esp. with ref to research and conflicts resolution with other fisheries, bait issues etc.		
References	Stakeholder consultations minutes		
		Likely PI Scoring Level (<60, 60-79, ≥ 80)	<60

Appendix 14: MSC's BMT tool Baseline and 5-year projections for Inshore Basket-trap Fishery

Principle	Component	Performance Indicator	Actual 2019	Expected 2020	Expected 2021	Expected 2022	Expected 2023
1	Outcome	1.1.1 Stock status	<60	<60	60-79	60-79	≥80
		1.1.2 Stock rebuilding	<60	<60	60-79	60-79	60-79
	Management	1.2.1 Harvest Strategy	<60	<60	<60	<60	60-79
		1.2.2 Harvest control rules and	<60	<60	<60	<60	60-79
		1.2.3 Information and monitoring	60-79	60-79	60-79	≥80	≥80
		1.2.4 Assessment of stock status	≥80	≥80	≥80	≥80	≥80
2	Primary species	2.1.1 Outcome	<60	<60	<60	60-79	60-79
		2.1.2 Management	<60	<60	<60	60-79	60-79
		2.1.3 Information	60-79	60-79	60-79	≥80	≥80
	Secondary species	2.2.1 Outcome	60-79	60-79	60-79	60-79	≥80
		2.2.2 Management	<60	<60	<60	60-79	60-79
		2.2.3 Information	60-79	60-79	60-79	≥80	≥80
	ETP species	2.3.1 Outcome	≥80	≥80	≥80	≥80	≥80
		2.3.2 Management	---	---	---	---	---
		2.3.3 Information	60-79	60-79	60-79	≥80	≥80
	Habitats	2.4.1 Outcome	60-79	60-79	60-79	≥80	≥80
		2.4.2 Management	60-79	60-79	60-79	≥80	≥80
		2.4.3 Information	≥80	≥80	≥80	≥80	≥80
	Ecosystem	2.5.1 Outcome	≥80	≥80	≥80	≥80	≥80
2.5.2 Management		60-79	60-79	60-79	60-79	≥80	
2.5.3 Information		≥80	≥80	≥80	≥80	≥80	
3	Governance and Policy	3.1.1 Legal and customary	≥80	≥80	≥80	≥80	≥80
		3.1.2 Consultation, roles and responsibilities	60-79	60-79	60-79	≥80	≥80
		3.1.3 Long term objectives	≥80	≥80	≥80	≥80	≥80
	Fishery specific management system	3.2.1 Fishery specific objectives	<60	<60	<60	<60	60-79
		3.2.2 Decision making processes	60-79	60-79	60-79	≥80	≥80
		3.2.3 Compliance and enforcement	60-79	60-79	60-79	60-79	60-79
		3.2.4 Management performance evaluation	<60	<60	<60	<60	60-79
Total number of PIs equal to or greater than 80			7	7	7	15	18
Total number of PIs 60-79			11	11	13	8	9
Total number of PIs less than 60			9	9	7	4	0
Overall BMT Index			0.46	0.46	0.50	0.70	0.83

Appendix 15: Main institutions relevant to the Fisheries Research, Management and Legislation along the Kenya Coast

INSTITUTION	ROLE/ INTEREST
<i>Government institutions</i>	
<ul style="list-style-type: none"> ▪ State Department of Fisheries & Blue Economy (SDF&BE) ▪ Kenya Fisheries Service (KeFS) 	CLIENT, Exploration, exploitation, utilization, management, development and conservation of fisheries resources
<ul style="list-style-type: none"> ▪ County Fisheries Directorates Kwale, Mombasa, Kilifi, Tana River and Lamu 	Governance and fisheries legislation
<ul style="list-style-type: none"> ▪ Kenya Marine and Fisheries Research Institute (KMFRI) 	Research on aquatic and coastal resources and environment
<ul style="list-style-type: none"> ▪ Beach Management Units (BMUs) & BMU Networks 	Exploitation and participatory management of fisheries resources and landing areas
<ul style="list-style-type: none"> ▪ Kenya Wildlife Service (KWS) 	Conservation and management of wildlife and enforcement of related laws and regulations. In charge of MPAs
<ul style="list-style-type: none"> ▪ Forestry Department 	Management and conservation of Kenya's forests (focus on Mangrove Ecosystems)
<ul style="list-style-type: none"> ▪ Kenya Navy 	Security and Surveillance international borders including EEZ
<ul style="list-style-type: none"> ▪ Kenya Maritime Authority (KMA) 	Custodian of laws relating to the territorial waters.
<ul style="list-style-type: none"> ▪ Kenya Ports Authority (KPA) 	Port management including cargo handling and regulation
<ul style="list-style-type: none"> ▪ National Environmental Management Authority (NEMA) 	Oversee the implementation of EMCA, 1999; Country's lead environmental watchdog
<ul style="list-style-type: none"> ▪ Coast Development Authority (CDA) 	Initiates and support developmental projects at the Kenya coast; both terrestrial and marine based.
<ul style="list-style-type: none"> ▪ East African Community (EAC) 	Promote integration of East Africa states. Provides for a legal framework to effectively streamline the management of trans-boundary ecosystem to enhance the quality of environment and ensure sustainable utilization of shared natural resources
<ul style="list-style-type: none"> ▪ Kenya Marine police 	Maintain security and order within the maritime zones; key of MSC issues and Prosecutions
<ul style="list-style-type: none"> ▪ Local Universities 	Research on Marine and coastal resources, fisheries, socio-economics
<i>Non-governmental organizations</i>	

▪ Worldwide Fund for Nature (WWF)	Environment conservation and management, Research, and fishery surveys
▪ CORDIO East Africa	Coastal oceans Research and development, climate change
▪ Wild life Conservation Society (WCS)	Research and monitoring of coral reefs ecosystems, climate change
▪ The Nature Conservancy (TNC)	Environment conservation and management, Research and fishery surveys
▪ Seacology	Focus on island habitats and communities for co-management initiatives and alternative livelihood support
▪ Tuna Fisheries Alliance of Kenya (TUFAC)	Advocacy on Tuna fishery in the Kenya and regionally.
▪ Kenya Fish Processors & Exporters Association (AFIPEK)	Ensure vibrant fish processing industry and sustainable management of fisheries resources
▪ Kenya Marine Forum (KMF)	Advocacy on marine environment and conservation
▪ Eco-Ethics International Kenya Chapter	Advocacy, social development, environment education and awareness
▪ Africa Nature Organization (ANO)	Water catchment management plans, BMU capacity building, co-management plans and mapping of co-management areas, advocacy and awareness creation, enterprise development.
▪ Coastal and Marine Resources Development (COMRED-Africa)	Coastal oceans Research and development, Socio-economic studies
▪ East Africa Wildlife Society (EAWLS)	Environment and wildlife conservation, and Advocacy
▪ KWETU training centre	Promoting diversified and sustainable livelihood activities, management of natural resources and community capacity building.
▪ Act Change and Transform (ACT)- formerly PACT Kenya	Capacity building and development, advocacy
▪ Community Action for Nature Conservation (CANCO)	Advocacy, capacity building and training

Appendix 16: Fishery Survey tool for the Stakeholder Meetings at BMU level

Fishery Pre-Assessment Survey Tool

FORM No. _____ / ____ / ____ /2018 / _____

DEVELOPMENT OF A BASELINE TO MEASURE PROJECT OUTCOMES ON GOVERNANCE & MANAGEMENT EFFECTIVENESS OF SELECTED MARINE PRIORITY FISHERIES IN KENYA

My name is _____ and I am collecting information for fishery status, habitats and Ecosystems and Governance / Management of selected priority fisheries under the Kenya Marine Fisheries and Social Economic Development (KEMFSED) Project within the State Department for Fisheries & the Blue Economy (SDF&BE), Government of Kenya. I would like to ask you some questions about your involvement in the fishery specifically, and issues on the fishery sustainability, impacts on habitats and other species, and management/governance issues in the fishery.

Your answers will be combined with those of other actors in the selected fishery to understand the gauge the status of the fishery, impacts on habitats/ ecosystems, and the existing management/ governance arrange geared towards sustainable fisheries. The results will be compiled in scientific reports and presented to SDF&BE KEMFSED Project for supporting the development of Fishery Improvement Plans to assists the fishery towards sustainability.

If you have any questions, Please ask me, or Contact **Dr. Fulanda** on +254-718-894-874 / Email: b.fulanda@pu.ac.ke

PART A

Survey Details

Name of Respondent: _____ Date: ____ / ____ / 2018 _____

-

Stakeholder type (e.g. GoK, industry, conservation etc.): _____ - Location: _____

Main Occupation: _____ BMU: _____

Household/

Dependants

(for resource-users)

[Adults: _____]

[Children: _____]

Demographics

Nationality: _____ Kabila: _____ Education: _____ Home Village: _____ Religion: _____

Fishery type by species:		Species-1	Species-2	Species-3	Alternative Livelihood engagements
Season	Name				1) _____ _____ 2) _____ _____
	kaskazi				
	Kusi				

PART B

1. Fishery Characteristics, Key issues and Management / Governance

<ul style="list-style-type: none"> ▪ What is the nature of your (your organization's) interest in the fishery (past, current, anticipated)? 	
<ul style="list-style-type: none"> ▪ What, if any, specific substantive issues or concerns do you have regarding the fishery? 	
<ul style="list-style-type: none"> ▪ Is the fishery conducted in a sustainable way – probe for over fishing? (Elaborate any issues & concerns on sustainability) 	
<ul style="list-style-type: none"> ▪ In depleted fisheries are there any interventions to recovery? 	
<ul style="list-style-type: none"> ▪ What are the interactions between the fishing gears, vessels with the environment? 	
<ul style="list-style-type: none"> ▪ Do the fishing methods, gears, vessels impact other species, habitats, wider ecosystem? 	
<ul style="list-style-type: none"> ▪ Is there a fishery management plan for the fishery? (If so, seek document for details) 	
<ul style="list-style-type: none"> ▪ Describe the fishery existing management structures; (landing site level to national level) 	

<ul style="list-style-type: none"> ▪ Describe the legal frameworks for the fishery management; (landing site level to national/international level) 	
<ul style="list-style-type: none"> ▪ Describe the institutional frameworks for the fishery management; (landing site level to national/international level) 	
<ul style="list-style-type: none"> ▪ Describe the role of the various stakeholders in the fishery management systems; (outline levels and roles including the resources required) 	
<ul style="list-style-type: none"> ▪ Summary of key issues based on the MSC Principles; fish stock sustainability, Habitats/ Ecosystems, and the Governance/management structures, and recommendations on how they can be addressed 	
<ul style="list-style-type: none"> ▪ Referrals to other stake holder / key experts/organizations who can provide/ support the data and information provided? 	
<ul style="list-style-type: none"> ▪ Other persons/ or organizations with interest in this fishery or the issues of concern raised? 	
<ul style="list-style-type: none"> ▪ Do you like time to consult with others/ organizations, to provide full input from you side?(esp. for BMU reps) 	
<ul style="list-style-type: none"> ▪ If so, how much time do you need? (provide schedule for follow-up meeting/call) 	
<ul style="list-style-type: none"> ▪ Let me summarize the key points that I have understood you to make in this interview thus far. (brief summary for clarification/ accuracy; add any new comments here) 	
<ul style="list-style-type: none"> ▪ Are you or your organization able to provide written summary of the key items to the Assessment Team? (provide timelines & contact persons/methods) 	
<ul style="list-style-type: none"> ▪ Do you want your inputs attributed you (as individual) or your organization? (whats your preference?) 	
<ul style="list-style-type: none"> ▪ Can we keep you informed/consults you for more information during this process? (contact Email / Phone No.?) 	
<ul style="list-style-type: none"> ▪ Briefly highlight key points of opportunity for input and expected timing of the process. 	
<ul style="list-style-type: none"> ▪ Do you have any questions? If any additional concerns come to you after this interview, please contact us before (Timeline b4 Draft Report) 	

2. Community Participation in Fishery [Level: lowest (1) to highest (5)]

Attributes	1	2	3	4	5	Areas of involvement?
What is the level of involvement of men fishers in your fishing?						
What is the level of involvement of women in your fishing?						
What is the level of involvement of Youth in your fishing?						
What is the level of involvement of indigenous fishers in your fishing?						
Out of your catch, how much fish do you sell (not eaten) (proportion)?						Or kg daily:

3. Types of Gears Used in the Fishery [Level: lowest (1) to highest (5)]

Attributes	1	2	3	4	5	Details
Are the gears used in the fishery affordable (perception)?						
What is the frequency of loss of fishing gear at sea?						
Where do you buy your fishing gears?						Explain:
What are the gears made of (nylon, monofilament, multifilament)?						Explain:
Are the gears used in the fishery legal under Fisheries Law 2016?						Explain:
After fishing do you leave the fishing gear at sea or carry it back?						Explain:

4. Fishing Crafts Used in the Fishery [Level: lowest (1) to highest (5)]

Attributes	1	2	3	4	5	Details
Detail the crafts used in the fishery						
How affordable are the fishing crafts used in the fishery?						
How seaworthy are the fishing crafts used in the fishery?						
How easy/cheap is it to repair/maintain the fishing crafts used in the fishery?						

Are the boats equipped to store (cold) catch for long periods?									
Is the fishing craft(s) you use in the fishery constructed locally?	Yes No	Explain:							
What is the mode of propulsion of fishing crafts (Pondo, Tanga, engine etc.)? (category+%)	Explain:								
What is the material of your fishing crafts (timber, fibreglass, etc.)? (category+%)	Explain:								
What is the capacity of the vessels (length/tonnage)? #crew?	Metres: Crew:			Explain:					
(Collate data on Vessels and capacity) Vessel type/Length/#Crew									
How far offshore do the fishing craft go fishing?	nM:			Explain:					
Distance between fishing grounds & market?	Km:			Explain:					
How long does it take between fishing and market	Hours:			Explain:					

5. Ecosystem Impacts of the Fishery

Where are the fishery conducted (Coral reefs, Sea-grass beds, etc.)?	Habitat:	Elaborate:							
How many other fishers are present in those fishing grounds/day?	Habitat:	Elaborate:							
Does the fishery impact the ecosystems in the fishing grounds	Habitat:	Elaborate:							
	Rank [Level: lowest (1) to highest (5)]	1	2	3	4	5	Details		
Does the fishery catch other species other than target?									
Does fishery catch juveniles of target species?									
Does fishery catch juveniles of other fish species,?									
Does fishery catch ETPs (marine mammals /Cetaceans Dolphins, Dugongs etc.)?									
Does the fishery catch sea turtles (Kasa)?									
Does the fishery catch sharks (Papa)?									
Does the fishery catch rays and skates (Taa)?									

PART C

1. Post-harvest handling and marketing

How do you handle the fish (detail equipment, process and distribution to market)									
Do you preserve / process your fish? if yes detail									
What do you require to increase the rate of returns from your fishing (trading) activities?									
How much fish do you lose to spoilage between fishing grounds (buying site, if trader) & market?	E.g. (x/10)kg			Explain:					
Does the fishery provide good income to you?	Yes/No			Probe for income/month or year:					
How would you rate the value addition potential of the fishery?	1	2	3	4	5	Explain:			

2. Production and Catch [Level: lowest (1) to highest (5)]

Attributes	1	2	3	4	5	Explain *season etc.
Have catches increased since you started fishing and today?						
Has species composition changed since you started fishing and today?						
Have the fish sizes declined since time you started fishing and today?						
How have prices increased since you started fishing?						

3. Resource Exploitation, Management & Value Chain Analysis [Level: lowest (1) to highest (5)]

Attributes	1	2	3	4	5	Details
How well-managed / sustainably exploited is the fishery in this area?						
Is the exploitation/management well-structured (level-ground) for all actors?						
Do you feel the fish market are well-structured (level ground) for all actors?						
Is the target fish species well integrated into the marketing structures of the other species from this area (<i>inapata kipao sawa</i>)?						
Do you know of any policy framework/institutional arrangement for management of the fishery in this area currently?	Yes	If yes, explain				
	No					
Do you know of any policy framework/institutional arrangement for enhancing fish markets in this area currently?	Yes	If yes, explain				
	No					

4. Local Management Structures – Legislation and BMU Involvement [Level: lowest (1) to highest (5)]

Attributes	1	2	3	4	5	Explain:
Are BMUs involved in managing the fishery?						
Do BMUs provide any services at landing site?						
Are BMUs involved in marketing of the fish?						
Do BMUs have infrastructure (e.g. depot/local market) to market the catch?						
Are there any illegalities in fishery/trade?						
Do BMUs participate in controlling the illegalities?						
Are BMUs effective in implementing regulations?						
Do BMUs collaborate with other stakeholders in the fishery management & legislations?						
Are there management (defined) measures for the fishery?						
Are legislations and regulations known to the BMU Assembly and Network?						

10. Livelihood Analysis [Level: unfavourable (1) to highly favourable (5)]

Attributes						1	2	3	4	5	Details		
What comprises the most expenditure in your livelihood?	Item	Vessel repair	Gear repairs	Fishing costs	Hous e Rent						Household food	School fees	Other :
	%												

PART D: Structure & Operations of the Fishery Markets

1. In this section, we would like to get information on market

To whom do you sell your fish?	Buyers sold to: (Rank most important 1-7 scale)		Is your buyer a Regular?	Location/site of sale?	If you sell to another trader do you know who they sell to
	NEM	SEM			
Boat owner	#	#	Yes / No		
Small-scale (<i>Wachuuzi</i>)	#	#	Yes / No		
Tajiri (<i>Large scale, local</i>)	#	#	Yes / No		
Company agents	#	#	Yes / No		
Fish shops/traders	#	#	Yes / No		
Others:	#	#	Yes / No		

2. Market Linkages and arrangements

Do you have any fishers tied to you?	Yes	If yes, what arrangements?	Fixed price	Use their equipment	Credit
	No		Supply quantity	Frequency supply	Other:
Do you have any traders tied to you?	Yes	If yes, what arrangements?			
	No				

Do you have formal/informal agreements with other fisher/traders	Yes	If yes, elaborate:
	No	

After the Interview

RELIABILITY NOTES for enumerator only

Please indicate to what degree you feel the respondent was reliable in answering the survey:

Highly reliable

Moderately reliable

Not very reliable

If you feel answers were unreliable, please explain why below and, if possible, explain to which questions you think the answers given are particularly unreliable

Thank you Note:

I take this opportunity to thank you for patience and time, and for giving me an opportunity to talk to you and understand the priority fisheries and the issues that are facing the sector. Thank you very much and all the best in your activities.

Appendix 17: Detailed Activity Report for Execution of the Consultancy under KEMFSED Project June 2018 through March 2019

Activity	Location	#Day	Parties / Stakeholders	Items	Schedule
Briefing by the Project team/Client/World Bank: - - Project Office (Maji House) Nairobi - World Bank Offices Nairobi - Priority Species selection	Nairobi	4 days	SDF&BE (Coast, Project team/ Director)/ World Bank Team /Consultant	- Negotiation - Inception Report presentation	June 2018 , 2017
	Mombasa	2 Days	SDF&BE Mombasa/ Assignment Supervisory team	-Identification/ confirmation of stakeholder & Species -Field Planning schedule	26 th -28 th July, 2018
Desktop Analysis / Data and information collation from SDF&BE Mombasa, KMFRI, County Level	Kilifi / Mombasa	8 days	Consultant Team/ SDF&BE Mombasa / Assignment Supervisory team	-Data collation on selected priority species, -Pre-analysis of Catch-Effort; biological; Ref. pts; Governance	29 th June to 26 th Nov., 2018
Consultation with BMU and Other Stakeholders (incl. industry) at County Level, relevant institutions on the ground in the five (5) counties; and administration of questionnaires to BMU KIIs (3 KIIs from each BMU, with 1 office holder, and 2 fishers)	County Meeting August, 2018: Mombasa -1 st Kilifi- 2 nd ; Malindi 3 rd /4 th ; Kwale 5 th /6 th ; Lamu / Tana River 7 th -13 th ;	13 days	Consultant Team/ SDF&BE Supervisory team / County Directorates of Fisheries / BMU Representatives / BMU network	-Consultation with BMU and Other Stakeholders and -KII interviews	Jan/Feb, 2018
Working Meetings for Pre-Assessment using the MSC Standard tools	Moana, Kwale March, 2019	5 days	Consultant Team / Experts from SDF&BE / KMFRI and other relevant institutions.	-Data collation on selected priority species, -MSC Pre-assessment and BMT tool Analysis	Feb/ March 2019

Preparation of Reports:-					
i). Draft Report Preparation: - Report d1: Work undertaken incl. Methodology - Report d2: Description of priority fishery characteristics; species, bycatch, habitats, ecosystems, management and governance - Report d3: Draft Pre-assessment report for each selected fishery (with MSC standard) incl. ratings on PIs, justifications, etc	Kilifi / Mombasa/ Correspondence	20 days	- Consultant & team with consultations from Project team and client SDF&BE at Coast and National office	-Data Analysis, -Literature review -Desktop analysis -Collation of Data and information from questionnaires	Dec/Jan 2019; Submission of Midterm Report (Draft 1)

<p>- Report d4: Draft Benchmarking & Tracking (BMT) tool for each selected fishery, filled for baseline YR1 based on pre-assessment ratings;</p> <p>- Report d5: Draft recommendations for updating of the assessments for monitoring progress of each UoA under, and impact of, the KEMFSED project.</p>				-Consultations with Client and Project Team	
<p>ii). Draft Report Submission, Circulation and Presentation for inputs</p>	Kilifi/Mombasa/ Nairobi / Core	5 days	- Consultant / Client / Stakeholders Input	-Consultations with Client and Project Team	
<p>iii). Final Reports d1-d5: Finalize the Draft Report documents after review and comments from the Client, Project team and relevant stakeholder</p>	Kilifi / Mombasa / Nairobi	10 days	- Consultant & team (simultaneous working through the 9-week Consultancy period)	-Consultations with Client and Project Team & review of ToR deliverables	March/ April, 2019
<p>iv). Compile Documents as per ToRs Review: - Submit the FINAL REPORT (FTR)</p>	Nairobi, Kenya/ Research & correspondences	5 days		-Consultations with Client and Project Team	

Appendix 18: Summary of Stakeholder Consultations and Findings

KEMFSED Project Baseline survey was conducted along the coast from Kwale to Lamu. Field Surveys were conducted between 27th January to 5th February, 2019 in the counties of Mombasa, Kwale, Kilifi, Tana River and Lamu.

Table 26. List of BMU involved in the stakeholder consultation process

Coastline	Field Dates	BMUs represented
MOMBASA (14)	28 th Jan, 2019	Mtogwe; shomoroni; Timbwani; Likoni; Nyali; Bamburi; Tudor; Shikaadabu; Mwangala; Kidongo; Mkupe; Old Town; Ngare; Jomvu mkuu
KWALE (16)	29 th -30 th Jan, 2019	Majoreni; Chalejeza; Tiwi; Waa/Kikadini; Mkwiro; Mwaepe; Wasini; Shimoni; Jimbo; Mwakamba; Mwandamu; Nyari; Vanga; Gazi; Chale
KILIFI (17)	31 st Jan, 1 st Feb, 2019	Uyombo; Bofa; Gongoni; Marereni; Mkuruwetu; Kuruwitu; Mtwapa; Mnarani; Kanamai; Malindi; Roka; Kilifi Central; Watamu; Shera; Ngomeni; Takaungu
LAMU (13)	2 nd & 3 rd / Feb, 2019	Kiwayu; Pate; Kiwayu; Myabogi; Chumbo; Shanga/Ishikani; Kizingitini; Faza; Mbwajumwale; Shangarubu; Shela; Amu; Matondoni
TANA RIVER (1)	4 th Feb, 2019	Kipini

Fisher Population Demographics, and Trends in Fishing

- Dependents per household varied by county
- Kwale had highest dependency, at 11 adults and 3 children per household

Fishing gears and vessels

- Longline, Castnets, Basket traps, Monofilaments and Gillnets were among the common fishing gears used.

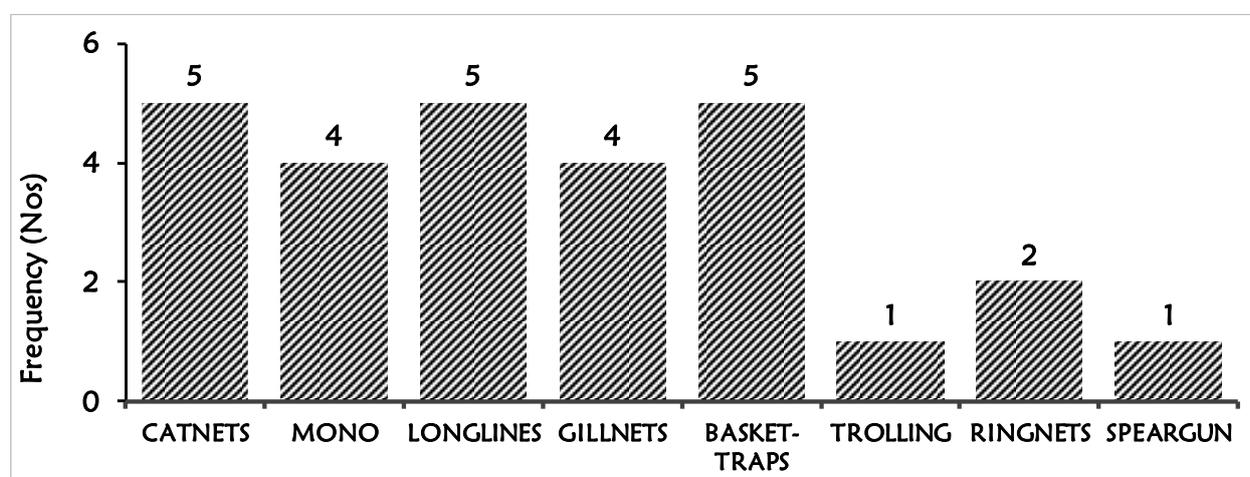


Figure - Fishing gear types from sample of fishers interviewed along the coastal counties

Fishing Crafts

- Fishery dominated by canoes (80%), Dugouts (dau), and modern boats e.g. Fibre Reinforced plastics (FRB or fibre boats) account for < 5 %.
- Depicts low fishery efficiency, and little re-investment into the fishery taken into account the income from fishery landings
- Would be critical to revive boat building workshops at BMU levels to boost modern vessel numbers into the fishery, improve safety and also deep sea worthiness of the vessels.
- Additional options for vessels and gear financing should be explored; training on financial management and enterprise budgeting both at fisher and BMU level also critical

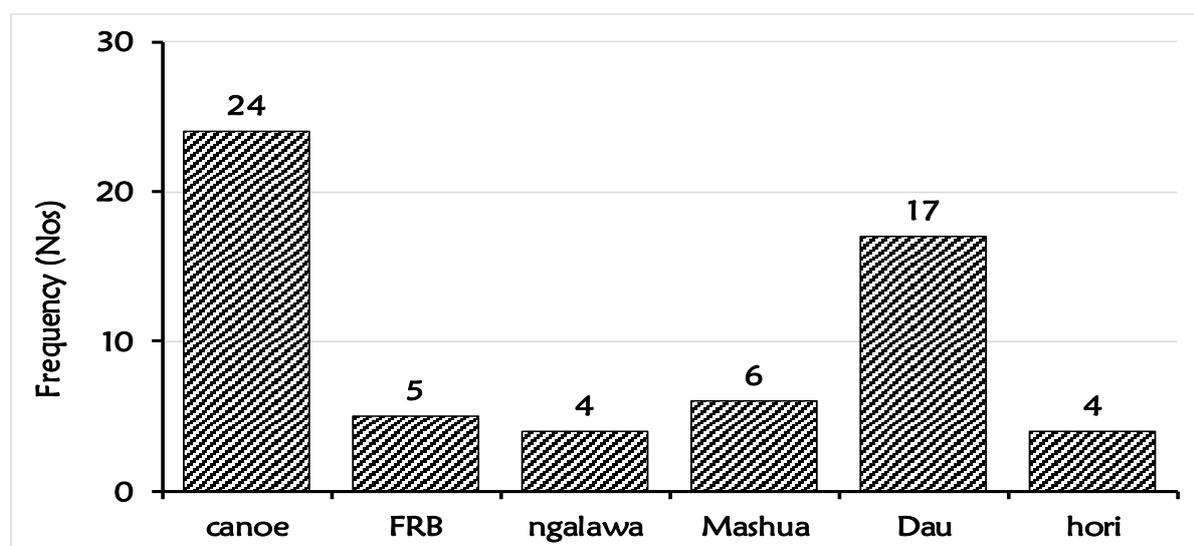


Figure: Fishing craft types from sample of fishers interviewed along the coastal counties

Ecosystem impacts & Awareness

- Most fishermen **believe** that their gears were not impacting the ecosystem in anyway
- Many saw Spear guns for Octopus fishery as biggest threat especially on corals.
- Others considered to have some impacts were; monofilament & mosquito net seines
- Lack of capital was blamed for the use of illegal and detrimental gears
- A lot of awareness needed to enlighten fishers on gear impacts on ecosystems and habitats
- Explore more sustainable gear replacement programmes; previous trials have reportedly failed after fishers sell the supplied fishing gears.
- Despite ban on some gears, continual use of the gears was evident; more vigilance (MCS) required backed up with awareness campaigns and stakeholder involvement e.g., removal of Juyas in Lamu.

Local management structures

- BMUs are the institutional basis for fisheries co-management
- accompanied by a legal recognition of stakeholders as stewards of aquatic resources.
- Participation of local communities is a vital factor in achieving the goals
- However, fishers felt most BMUs have turned into family entities, hence the fight between villages for stewardship of the BMU offices

- Many fishers reported little support from BMUs, and most termed the BMUs as “another government” just out to collect fees without offering any services
- Fishers reported “closer links” between BMU officials and “Fisheries” (read as SDF, KeFS or County Fisheries Directorates) than with the fishers, hence
- BMU restructuring and training should be critical part of the KEMFSED project to improve on fishery management and conservation.
- Key areas:
 - o BMU structuring (not just a group of fishers as currently constituted),
 - o Office bearers; varied – fishers, traders, input suppliers and Markets; both small-scale and large scale inclusion
 - o Marketing structures (consider value addition critical, and infrastructural development to support value addition and market; freezing, filleting, BMU restaurants etc.),
 - o Licensing (consider group licensing)-BMU
 - o Funding (esp. for gears and vessels) – consider recycle fund with stringent structures, avoid repeat of “Failed recycle funds, e.g. NORAD), or free gifts (KCDP)
 - o Need to have an approach to revamp the fishery, e.g. recruit youths into fishing (internships on long liners, trawlers etc.), TVETs on entrepreneurship esp. the value addition etc.

Resource exploitation, Management, Value-chain Analysis and Post-harvest handling

- Species caught as primary species were mostly mixed species resulting from non-specific gears.
- Low catches reported in SEM; rough weather but actually more stocks near shore
- SEM Season – over concentration of fishers nearshore (e.g. some fisheries with over 10 fishing boats, ~80 fishers per time) =higher ecosystem impacts.
- Explore options to reduce pressure exerted on inshore resources; development of the value chains would create more jobs downstream in trade, markets etc rather than concentration on ‘removals’ with huge post harvest losses especially during some months of the SEM season.
- need for proper handling and processing of fish is important both for the fishing industry and for the consumers, improvement of the processing and handling of fish in terms of quality, product range and volume = increased economic activity and employment.
- Most fishermen lack storage facilities; only 5/ 60 had cooler boxes on board to keep the fish fresh during fishing
- Most dependent on ‘shade cooling’ on the floor of the boat

Livelihood Analysis

- Most of the fishery income was mostly spend on food for the family with little savings for re-investment
- Income diversification is a critical need for the small-scale fishery industry for sustainable exploitation to pick/install

Fisheries Management Plans

- Numerous fishery management plans already in place from previous projects: -

-
1. Prawn Fishery Management Plan 2010
 2. Small and Medium pelagic fishery management plan
 3. Ringnet management plan
 4. Lobster management plan
 5. Ornamental fishery management plan
- However, little implementation/monitoring of the same; need for M&E on these management plans to assess the levels of implementation, stakeholder participation etc.
 - Role of BMUs in implementation needs re-evaluation

Overall

- Local management structures (BMU) are well distributed along the coast but their role is poorly supported by its members to provided essential services.
- Ecosystems threatened by illegal gears, augmented by low level of awareness among fishers.
- Therefore, overall; need to lay out KEMFSED activities to align with addressing specific issues within the SSF along the coastal kenya, rather than general activities without targeted outcomes.