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Bay of Bengal Large Marine Ecosystem Project Phase II

Report on National Consultation Workshop

Scoping EAFM Planning and Implementation Process in Sri Lanka's Bay of Bengal Region

16-17 January 2024 | NARA, Colombo

Organized By

National Aquatic Resources Research and Development Agency (NARA)
Colombo, Sri Lanka

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Preparation of the Report

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Executive Summary

The BOBP-IGO is implementing the Bay of Bengal Large Marine Ecosystem Project (Phase II) from 2023-28 for the benefits of its member-countries. The Project is funded by the GEF and the NORAD with the broad objective of ensuring a resilient ecosystem and sustainable fisheries in the BOBLME. One of the targeted outputs of the project is that at least 2 EAFM (Ecosystem Approach to Fisheries Management) plans are implemented in each country. To initiate the process of planning and implementing Fishery Management Units (FMUs) for EAFM in Sri Lanka, a National Consultation Workshop was organized by the BOBP-IGO in the National Aquatic Resources Research and Development Agency (NARA), Colombo, from 16-17 January 2024. The workshop was attended by 38 participants representing governmental, non-governmental, and fishers' organizations of Sri Lanka and BOBP-IGO.

During the Inaugural Session, Prof. M.J.S. Wijeyaratne, Chairman, NARA and Dr. P Krishnan, Director, BOBP-IGO emphasized the significance of the EAFM approach for the island country and the potential of BOBLME Phase II in implementing the same in Sri Lanka. Session 2 revolved around identifying potential EAFM units in Sri Lanka, with Prof. Sevvandi Jayakodi presenting a case study on implementing EAFM in Sri Lanka's bar reef. She also shared a case study of Sudan and highlighted the significance of stakeholder involvement and learning from EAFM implementation elsewhere in the world.

Selection of FMUs

The session involved breakout groups discussing and shortlisting potential EAFM sites across Sri Lanka. The following six FMUs were identified as potential sites for implementing the EAFM in the islands, during the scoping discussions group activities:

- Grouper fishery
- Sea cucumber fishery
- Puttalam – Kalpitya stretch.
- Puttalam Lagoon
- The spiny lobster fishery in Hambanthota District
- Small pelagic fisheries on the west coast.

The participants evaluated the sites using six criteria viz., stakeholder participation, government participation, technical & institutional capacity, scale, issues in the FMU and information/data availability through pair-wise comparison of all the sites using Analytic Hierarchy Process (AHP) software. The exercise was done in four groups, each representing diverse stakeholders.

Based on the comprehensive exercise, and selection process, the following three sites were identified as prioritized FMUs for implementation of EAFM in Sri Lanka:

- ***Puttalam Lagoon***
- ***Small pelagic fishery in the southwest coast***
- ***Sea cucumber fishery***

The BOBLME Project has scope for implementing EAFM in two FMUs. However, as discussed during the regional meeting and the GC meeting with BOBPIGO, the National Governments shall support additional site(s), where the BOBLME project activities shall be implemented simultaneously.

Scoping EAFM Plan Development

In Session 3 on Scoping EAFM Plan Development, group exercise was performed in four thematic areas, namely,

i. Identifying & Prioritizing Issues and Threats
ii. Identifying & Prioritizing Stakeholders
iii. Identifying Institutions & Individuals for Constitution of National Working Group (NWG); and
iv. Assessing Capacity Development Needs and Training

For performing this exercise, four FMUs were chosen by the four groups from their choice of FMU selection, namely grouper fishery, sea cucumber fishery, spiny lobster fishery and Puttalam Lagoon. This scoping exercise was used as an exposure to the participants to develop and implement FMUs in future. A detailed scoping document will be prepared later for each finalized FMU.

The summary of results across all the groups is given below:

***Issues and Threats in the FMUs*:**

Unsustainable fishing practices including overfishing and illegal, unreported, and unregulated (IUU) fishing, environmental degradation, habitat affecting both the ecosystem and human well-being. There are also conflicts between traditional and semi-industrial practices leading to regulatory compliance challenges.

***Stakeholder Prioritization*:**

The groups highlighted the importance including diverse stakeholders, namely the government bodies, local Government, fishers and fisheries societies, universities, value chain actors, environmental agencies, non-governmental organizations and seafood exporters.

***National Working Group Constituents*:**

The groups suggested a mix of governmental bodies including the Ministry of Fisheries, environmental departments, and local government bodies, non-governmental organizations, fisher organizations, research institutions, and trade bodies.

The scoping exercise underlined the complexities within each fishery, highlighting the need for collaborative participation of government, local communities, research institutions, and the private sector to ensure the long-term sustainability of fisheries resources in Sri Lanka.

Capacity Development Needs

The workshop included an assessment of capacity development needs crucial for planning and implementing the EAFM. This assessment used a matrix to evaluate various capacities across different stakeholder levels, including mid-level managers, research institutions/academia, non-government organizations (NGOs), and senior leaders/executives/decision-makers. The evaluation covered knowledge, decision-making, and transparency aspects, with participants providing their views on each stakeholder's capacity level.

Key findings include:

Knowledge:

1. Mid-level managers, NGOs, and senior leaders have medium knowledge bases, but their use and access to knowledge vary, indicating a need for improvement.
2. Research institutions/academia have a high knowledge base and access to knowledge but need to improve their use of this knowledge in practical applications.

Decision-making:

1. Evidence-based decision-making is strong among research institutions and senior leaders but is poor among mid-level managers and NGOs, indicating a need for developing analytical and evaluative skills.
2. The involvement of stakeholders is notably high in NGOs, suggesting their strength in collaborative approaches.

Transparency:

1. Implementation and communication transparency is high among senior leaders, pointing to effective leadership qualities.
2. Mid-level managers show strengths in attitude and cooperation, but their implementation and communication capacities are areas for development.
3. Research institutions and NGOs show poor cooperation and communication, highlighting a gap in engaging effectively with broader stakeholder groups.

The assessment underscores diverse capacity development needs across the stakeholder spectrum to ensure successful EAFM implementation. It highlights the necessity for targeted training programs to enhance knowledge application, evidence-based decision-making, and improve transparency and cooperation among the EAFM stakeholders.

Next Steps

- ***Identification of Project FMUs:*** *The Ministry of Fisheries, Sri Lanka will be requested to finalize any TWO FMUs from the prioritized FMUs for planning and implementing EAFM. If the government can support the third FMU in terms of arranging local logistics in the suggested site, the BOBLME project team will take up all the THREE FMUs for implementation, simultaneously*.
- **Preparation of Scoping Report** on characterization, identification of threats and issues, stakeholders, and capacity development needs for each FMU after final selection of the FMUs.
- BOBP-IGO shall engage a National Consultant and work closely with NARA to plan and implement the selected FMUs.
- **Constitution of the National Working Group** will be finalized in consultation with the Government.
- **Communication** with experts, institutions and government will be taken up for active follow-up of the project activities.

Epilogue

A systematic approach was followed to meet the objectives of the workshop; the approach provided an excellent impetus to kickstart the EAFM program in Sri Lanka and helped identify a range of options for action. It provided an opportunity to understand the issues and threats, the categories of stakeholders to be considered for planning and implementing EAFM, and identifying the capacity development needs and potential constituents of the National Working Group-EAFM.

It is recognized that the planning and implementation of EAFM need to strengthen collaboration and cooperation among the stakeholders. It is, therefore, necessary to identify opportunities that are of mutual interest and to communicate the importance of engagement.

All the participants extended full cooperation and were focused on the objective of the consultation process. Many participants had sound knowledge on the proposed EAFM sites and contributed to the group activities and discussions.

1. Overview of the BOBLME Project

1.1. Background

Bay of Bengal Large Marine Ecosystem (BOBLME) is one of the largest LMEs covering 6.2 million km^2. About 66 percent of the BOBLME lies within the Exclusive Economic Zone (EEZ) of BOBLME countries - Bangladesh, India, Indonesia, Malaysia, Maldives, Myanmar, Sri Lanka and Thailand. The remainder is the high seas area. The BOBLME is an area of high biodiversity and of important critical habitats and the natural resources are of considerable social and economic importance to the bordering countries. Fisheries and aquaculture contribute immensely to food security, employment and national economies.

The Transboundary Diagnostic Analysis (TDA) and Strategic Action Programme (SAP) phase of the BOBLME Project Phase I (2009-2015) identified three priority transboundary concerns and their proximate causes. These include 1) overexploitation of marine living resources, 2) degradation of critical habitats, and 3) pollution and water quality.

In order to address these issues, the countries jointly developed the SAP, which the Bay of Bengal Programme Inter-Governmental Organisation (BOBP-IGO) is all set to implement in its member countries under the BOBLME Phase II project titled ***"Sustainable management of fisheries, marine living resources and their habitats in the Bay of Bengal region for the benefit of coastal states and communities***."

1.2. Project Partners

The project is funded by the Global Environment Facility (GEF) and the Norwegian Agency for Development Cooperation (NORAD). It is implemented by the Food and Agriculture Organisation (FAO) of the UN, in partnership with three executing agencies *viz.,* BOBP-IGO, International Union for Conservation of Nature (IUCN), and Southeast Asia Fisheries Development Center (SEAFDEC).

1.3. Objective and Approach

The project objective is to contribute to the sustainable management of fisheries, marine living resources, and their habitats in the Bay of Bengal region, to reduce environmental stress and improve ecological status for the benefit of coastal states and communities.

This will be achieved through interlinked project components based on the SAP themes by undertaking country-led adoption of participatory, bottom-up, integrated focus area approach to planning and implementation at community, sub-national, national, and regional levels to ensure maximum possible impact.

1.4. Project Components

- Component 1. Sustainable Management of Fisheries
- Component 2. Restoration and conservation of critical marine habitats and conservation of biodiversity
- Component 3. Management of coastal and marine pollution to improve ecosystem health.
- Component 4. Improved livelihoods and enhanced resilience of the BOBLME
- Component 5. Regional mechanism for planning, coordination, and monitoring of the BOBLME.

1.5. Role of BOBP-IGO

BOBP-IGO will implement the project in its member countries, viz., Bangladesh, India, Maldives, and Sri Lanka. National execution partners include the Ministries of Fisheries and Agriculture, the Ministries of Environment, and other national agencies of the participating countries.

BOBP-IGO is responsible for the implementation of key parts of the work plan, including *"Sustainable Management of Fisheries"*, ensuring coordination and delivery of the work on the Ecosystem Approach to Fisheries Management (EAFM).

1.6. Expected Deliverables

One of the major activities under Component 1 is the implementation of the Ecosystem Approach to Fisheries Management (EAFM).

*The **expected outcome** of implementing EAFM in the member countries is that by the end of the project period, EAFM will be institutionalized at the national level, including targeted transboundary fish stocks.*

*The **expected outputs** are:*

(i) At least 2 EAFM plans implemented in each country;

(ii) National and regional platforms established or strengthened to involve grassroots stakeholders in management decision-making and

(iii) EAFM training is embedded in national and regional training institutions.

2. Scoping EAFM Planning and Implementation Process in Sri Lanka

2.1. Selection of Suitable Fishery Management Units1 for Piloting EAFM

Ecosystem Approach to Fisheries Management (EAFM) is a holistic strategy aimed at balancing diverse societal objectives by considering the knowledge and uncertainties about biotic, abiotic, and human components of ecosystems and their interactions.

> *This project seeks to establish EAFM pilot Units to demonstrate their efficacy and pave the way for broader adoption. Implementing EAFM in a country that needs more national examples presents unique challenges and opportunities.*

Selecting the right pilot EAFM Units for EAFM implementation is a strategic step toward demonstrating the benefits and facilitating national adoption. The chosen Fishery Management Units[1] (FMUs) will be showcasing the effectiveness of EAFM in achieving sustainable fisheries management and conservation goals. This approach, grounded in stakeholder engagement, ecological significance, governance structures, socio-economic considerations, and feasibility, will pave the way for a successful and scalable EAFM model.

2.2. Provisional Pilots Identified in the Project Document

The identification of pilot Units was considered during the project preparation grant phase of the BOBLME-2 (2019), and possible EAFM activities are outlined in the project document.

Country	Priority Areas and Species	Activity
Sri Lanka	• Northwest small Pelagic Species • Southeast Demersal Species • Sea cucumber Fishery • Gulf of Mannar	• EAFM Plan development • Alternative Fisheries Livelihood evaluation for inclusion in EAFM applications • EAFM Training to include reduction of post-harvest losses • Improved data collection and monitoring of SSF landings

Despite policy convergence towards EAFM at the macro-level, there has yet to be a concrete example of operational EAFM in the region. Further, there needs to be a clear recommendation from the concerned Governments on pilot Units.

The BOBLME-2 project provides a chance to develop models of success. The selection of pilot EAFM Units is the first step towards this. ***In this context, the selection of suitable EAFM Units plays a significant role in the success of the project.***

[1] *Fisheries Management Unit (FMU) is used to refer to the "EAFM pilot sites" as in the project document, and FMU is a more practical and accepted term in EAFM, which could be area-based, species-based, fishing gear-based, or critical habitat-based.*

2.3 Options for EAFM Interventions

A range of possible options for the selection of EAFM Units, along with examples, are presented in the Table below:

Option	Example
Critical Habitat -based	Coral reef-based; mangrove-based; lagoon-based.
Area-based	Provinces, Marine Management Areas
Species-based	Shark fishery, Pelagic fishery, Demersal fishery
Fishery-based	Gillnet fishery, Longline fishery
Issue-based	Reducing catch, pollution, coastal disasters, safety-at-sea, climate change
Transboundary	Transboundary fish stocks, ecosystems, issues

2.3. Scoping EAFM Plan Development & Implementation in the Selected FMUs

After selecting the potential EAFM pilot Units, the process of developing and implementing the EAFM plan has to be initiated. The requirements for initiating the process are to

(i) prepare a scoping report on the pilot units;

(ii) identify threats and issues;

(iii) identify working groups for planning and implementation;

(iv) identify the stakeholders;

(v) network the institutions and individuals;

(vi) assess capacity development needs and training; and

(vii) identify strategies to move towards EAFM by aligning with national policies.

3. Overview of National Consultation Workshop

3.1. Purpose and Objectives

The purpose of the workshop was to bring stakeholders together to (i) identify potential pilot EAFM Units and (ii) initiate the process of scoping EAFM planning and implementation in the identified pilot sites.

The Objectives of the Consultation Workshop were to:

(i) Share information on the BOBLME Project;

(ii) Identify potential EAFM Units for developing plans and implementation;

(iii) Initiate the process of scoping EAFM planning and implementation in the identified pilot units and

(iv) Establish partnerships with and amongst stakeholders for future collaboration.

3.2. Workshop Methodology

The two-day workshop focused on the objectives mentioned above. It served as a forum to apply the perspective and experience of the participants to screen potential EAFM Units and initiate the EAFM process. The workshop was conducted in English.

The Agenda of the Workshop is placed in Annex I.

The following set of information materials was shared with the participants

- prior to the workshop to ensure engaging discussion:
- An Overview of Ecosystem Approach to Fisheries Management
- Methodological Framework for Selection of Suitable Pilot Units for EAFM
- Definition and selection of Fishery Management Units
- Identifying & Prioritizing Issues and Threats
- Identifying Stakeholders
- Identifying Institutions & Individuals for Constitution of National Working Group
- Assessing National Capacity Needs for EAFM.

The selection of EAFM Units was made through group activity in 4 breakout sessions in two steps. First, a list of potential Units was prepared by each group. In the second step, the Units were prioritized by ranking each Unit based on six criteria and applying weightage for each criterion. For prioritization, the Analytic Hierarchy Process (AHP) tool, developed by the ICAR-National Academy of Agricultural Research Management (ICAR-NAARM), India, was applied. The Project Team demonstrated the application of AHP. The criteria for identifying the EAFM Units was finalized by the BOBP-IGO in an earlier online consultation with experts in December 2023. The output from that consultation on the criteria and weightage for each criterion was applied in the present Consultation Workshop.

The workshop comprised presentations by resource persons, and a significant amount of time was allotted for interaction with experts and activities in breakout groups. The analytical

Hierarchal Process (AHP) Tool was used as an activity for selecting the EAFM Units, and the BOBP-IGO Project team moderated the activity.

3.3. Participants

The workshop was attended by 33 participants representing several government, non-government and fishers' organizations and 5 participants from BOBP-IGO. The list of total participants and group-wise participants is placed in Annex II.

4. Summary of the Proceedings

4.1. Opening Session

The workshop commenced on 16 January 2024 at 0945 h. In the Opening Session, after the Welcome Address by Dr R.P. Prabath Jayasinghe, Principal Scientist, NARA, and self-introduction by the participants, the workshop was inaugurated by Prof. M.J.S. Wijeyaratne, Chairman, NARA. In his address, Prof Wijeyaratne emphasized the importance of implementing EAFM in Sri Lanka. He thanked BOBP-IGO for selecting NARA as the venue for conducting the Workshop. Dr P Krishnan, Director, BOBP-IGO briefed the Context and Approach to the Workshop (Annex III). After the presentation by Dr E Vivekanandan, Senior Consultant, BOBP-IGO 'An overview of EAFM' (Annex IV), Mr H. M. K. J. B. Gunarathne, Additional Secretary (Development), Ministry of Fisheries, Sri Lanka made his opening remarks and mentioned that it is timely that the BOBLME Phase II has been initiated to adopt SAP.

4.2. Session 2: Identifying Potential EAFM Units

In Session 2, 'Identifying Potential EAFM Units in Sri Lanka,' Prof. Sevvandi Jayakodi, Wayamba University, presented a case study on her experience in implementing an EAFM in the bar reef in Sri Lanka (Annex V). She emphasized that the first step is to assess the implementation potential of EAM in the site. The stakeholders have a key role in planning and implementing the EAM. She also mentioned the initiative taken in Sudan to implement EAFM and that it is a learning for Sri Lanka that even without a proper management structure, the project team could make progress in implementing EAFM in Sudan.

After the presentation of the case study, the participants were segregated into four breakout groups of 8 members in each group for all subsequent group activities. In the first activity, each group discussed among themselves to short-list 2 or 3 potential EAFM sites in Sri Lanka. For short-listing the potential sites, the BOBP team guided the groups by making a brief presentation on the criteria to be followed (Annex VI). The groups were guided to take into consideration the implementation potential. After the discussions, a representative from each group made a presentation on the potential sites by justifying the rationale behind the selection. The groups short-listed the following sites:

Group	Short-Listed Sites
I	1. Grouper fishery 2. Puttalam Lagoon
II	3. Seascape of Puttalam – Kalpitiya stretch. 4. Sea cucumber fishery in Mannar-Kilinochchi-Jaffna stretch
III	5. Small pelagic fisheries in the southwest coast 6. The spiny lobster fishery in Hambanthota District 7. Small pelagic fisheries on the east coast
IV	8. Puttalam Lagoon 9. Great and Little basses in the southeast coast

The presentations were followed by discussion. As only 2 sites needed to be selected for the project, the groups were tasked to prioritize the sites by ranking the sites. Of the 8 sites, one site, namely the small pelagic fisheries on the east coast were not subjected to the analysis, as it was the third choice of Group 3. For the remaining 7 sites, six criteria, namely stakeholder

participation, government participation, technical and institutional capacity, scale of the FMU, issues in the FMU and information/data availability were used for prioritization. For prioritizing exercise, application of AHP tool was demonstrated and explained by the BOBP-IGO Team along with the weightage for each criterion (Annex VII). For the AHP application, pairwise comparison of sites was made criterion-by-criterion. Each group had detailed group-level discussion and assigned scores for all the 7 FMUs/Sites by applying AHP tool and assigned weightage for each criterion. This activity was elaborate. As it could not be completed on Day One, it was continued on Day 2.
After completing the group exercise on Day 2, each group made a presentation on the output.

Result from the group activities on the scores for each FMU/Site (Box colored yellow denotes the first choice of each group; blue color denotes the second choice)

FMUs/Sites	Group 1	Group 2	Group 3	Group 4
Grouper Fishery	23.04	4.2	2.24	5.55
Puttalam-Kalpitiya Stretch	10.37	37.96	4.4	15.72
Sea Cucumber Fishery in Mannar-Kilinocchi-Jaffna stretch	30.02	8.08	7.05	9.23
Puttalam Lagoon	7.58	19.86	16.8	46.63
Small Pelagic Fisheries in the Southwest Coast	5.54	4.43	40.1	16.09
Spiny Lobster Hambanthota	21.93	11.04	27.89	5.42
Great And Little Basses	1.52	14.42	1.54	1.35

Barring Great and Little Boxes, all the other sites were scored either as the first or second choice of any one of the groups. The Project Team decided to drop Great and Little Basses. In general, the result showed wide differences between the groups in finalizing the EAFM Units. This is not unexpected as it reflected the views of participants with varied backgrounds and expertise. The difference in allotting scores for pairwise comparison on EAFM sites for each criterion is presented in Annex VIII.

To narrow down to 3 FMUs, the following criteria were used:

i. The FMUs that were assigned first two places by any two groups, namely Puttalam Lagoon and Small Pelagic Fisheries in the Southeast Coast, were prioritized as the first two choices.
ii. Puttalam-Kalpitiya stretch was eliminated as the location is very close to Puttalam Lagoon, that has been prioritized for selection. Of the remaining 3 potential FMUs, the Sea Cucumber Fishery in Mannar-Kilinocchi-Jaffna stretch, that was assigned the maximum score by any one group (30.0), was prioritized. Moreover, the BOBLME Project Document has identified the sea cucumber fishery as potential FMU for implementing EAFM.

Thus, the Puttalam Lagoon, Small Pelagic Fisheries on the Southwest Coast, and Sea Cucumber Fishery in the Mannar-Kilinocchi-Jaffna stretch were prioritized as the FMUs.

The Ministry of Fisheries, Sri Lanka will be requested to finalize any TWO FMUs from the prioritized FMUs for planning and implementing EAFM. If the government can support the third FMU in terms of arranging local logistics in the suggested site, the BOBLME project team will take up all the THREE FMUs for implementation, simultaneously.

4.3. Session 3: Scoping of EAFM Plan Development & Implementation in FMUs

In Session 3, group exercise was performed in four thematic areas, namely, (i) Identifying & Prioritizing Issues and Threats; (ii) Identifying stakeholders; (iii) Identifying Institutions & Individuals for Constitution of National Working Group (NWG); and (iv) Assessing Capacity Development Needs and Training. For performing this exercise, four FMUs were chosen by the four groups from their choice of FMU selection. This scoping exercise was used as an exposure to the participants to develop and implement FMUs in future. A detailed scoping document will be prepared later for each finalized FMUs by the Project team.

Each group discussed the problems prevailing in any one of the EAFM Units. The groups were given guidance to classify the issues into three categories, namely, ecosystem well-being, human well-being, and good governance. The groups were provided with charts, papers and cards to document their discussions.

To identify stakeholders, each group continued to work on the same EAFM Unit for which it identified the issues. An explanation on the procedure for stakeholders' identification, and the participants used a 2x2 matrix. In the matrix, each group plotted (i) how important the stakeholder is to the EAFM process (Y axis) and (ii) how much influence (power) they have over the EAFM process (X axis).

The Constitution of a National Working Group is crucial to engaging with community members and working through the EAFM planning and implementation process. To facilitate the Project Team to identify the NWG, a consultative process was followed, and each participant was tasked with identifying the members of the NWG that would be taken forward to the government for further consultation. The Project Team listed the broad categories of institutions/individuals, and each participant ranked each constituent in the list.

4.4. Group-wise Results

4.4.1. Group I: Grouper Fishery

Brief about Grouper Fishery

Groupers sub-family Epinephelinae is called 'Kossa" in the local language. In Sri Lanka, groupers are recognized as one of the most demanded food fish groups in the local and international markets. They are ecologically important as top predators typically feed on fish, octopuses, and crustaceans. Groupers are localized fishes that concentrate on specific geographical locations and habitats. The outboard engine fiberglass boats are mainly engaged in grouper fishing activities. The grouper fishery operates around the year with a limited number of fishing days during the two monsoons. Women are often engaged in selling the catch. The following key species are available in the commercial catches: *Cephalopholis argus, C. formosa, C. rogaa, C. sonnerati, Epinephelus areolatus, E. bleekeri, E. chlorostigma, E. coioides, E. faveatus, E. longispinis, E. malabaricus, E. radiates* and *E. undulosus*.

According to the recent research findings of NARA, the stock of grouper resources along the Sri Lankan coast has significantly declined (Athukoorala et al., 2021; DOI:10.1016/j.rsma.2021.101755). This confirmed earlier analyses conducted with the Dr Fridtjof Nansen fishery-independent survey data collected in 2018.

Issues and Threat

Unsustainable fishing practices severely impact the ecosystem and overall well-being. The fishery operates without proper regulations. Illegal, unreported, and unregulated (IUU) fishing practices, such as spearfishing, further contribute to the problem. The use of bottom-set gill nets poses a threat, causing high ghost fishing and harm to the marine environment. Human activities also contribute to coral reef damage, exacerbated by climate change-induced coral reef bleaching.

In terms of human well-being, the fishery's sustainability challenges translate into reduced catch quantities, leading to fluctuating seasonal incomes. Conflicts arise between fishers and the tourism industry, as well as with other small-scale fishers. Poor landing facilities and limited post-harvest technologies hinder the development of the sector. Beach erosion, storms, and cyclones further compound the challenges faced by the fishery.

In addressing the governance issues, there is a pressing need for the establishment of proper management initiatives, entry barriers, and export regulations. Additionally, fostering improved coordination and communication channels between research institutions, regulatory bodies, and resource users is essential to ensure the long-term sustainability of the grouper fishery in the east coast of Sri Lanka.

Identifying Stakeholders and Stakeholder Prioritization

High Importance / Low Influence	***High importance / High Influence***
1. *Universities* 2. *Ceylon Fishery Harbours Corporation* 3. *Processing Plants* 4. *Value Chain Actors* 5. *Input Suppliers* 6. *Customs*	1. *Fishers* 2. *Fisheries societies* 3. *Ministry of Fisheries* 4. *Community Leaders* 5. *Department of Wildlife Conservation* 6. *National Aquatic Resources Research and Development Agency* 7. *Exporters* 8. *Department of Fisheries and Aquatic Resources* 9. *Customs* 10. *Diving Societies*
Low Importance / Low Influence	***Low Importance / High Influence***
1. *Archaeology department* 2. *Tourism Board* 3. *National Aquaculture Development Authority* 4. *Safari boat Owners*	1. *Police* 2. *NGOs* 3. *Sri Lankan Coast Guard* 4. *Marine Environment Protection Authority* 5. *Forest Department* 6. *Sri Lankan Navy* 7. *Central Environmental Authority* 8. *Politicians* 9. *Religious place*

Constitution of National Working Group

The group identified and ranked the following constituents for the NWG:

1. Ministry of Fisheries / Department of Fisheries
2. Coast Guard / Navy
3. Ministry of Environment and affiliated Department

4. Rural Fisheries Organization
5. Local/ District Govt Bodies
6. Research and Academic Institutions
7. Non-governmental Organization
8. Trade Bodies

4.4.2. Group II: Sea Cucumber Fishery

Brief about Sea Cucumber Fishery

Sri Lanka's Sea cucumber fishery is primarily artisanal and contributes to the livelihoods of fishermen in the coastal region. The fishery in Sri Lanka is existing for a long period, having been introduced by the Chinese. Monsoonal winds greatly influence Sri Lanka's sea cucumber fishery during the time of the southwest and northeast monsoons. The fishery is carried out less intensively along the Northern coast compared to the Eastern and Northwestern coasts.

There are 24 sea cucumber species identified in Sri Lanka's coastal waters. Eleven of these species are predominant in the commercial landings of the North and Northwest Coast fishery, and nine species are predominant in the East Coast fishery. Off the northwestern coast, from Puttalam to Mannar, harvesting occurs intensively during the northeast monsoon (October to April). The sea cucumber fishery in Sri Lanka is facing over-exploitation as global demand for beche-de-mer (processed sea cucumbers) continues to rise, and the sea cucumber fishery remains largely unregulated.

Farming of sea cucumbers has progressed in the Northern Province in the last few years. The farming activities are not regulated and are facing several issues.

Issues and Threat

The sea cucumber fishery in the Mannar to Jaffna region of Sri Lanka faces several critical challenges, impacting both the ecosystem and human well-being. Depleted stocks are a significant concern, resulting from unsustainable fishing practices that involve the over-collection of adults and exploration of wild juvenile catches. The use of Indian bottom trawling further exacerbates the problem, contributing to the unsustainability of the fishery. Pollution poses another threat to the ecosystem, with land-based effluent discharge, diesel and kerosene pollution from boats, and interruptions of water circulation due to farming activities. Additionally, fencing materials like PVC contribute to habitat degradation.

The impact on human well-being is evident in disputes between nursery collectors and commercial divers, as well as conflicts between Indian fishers and artisanal fishers in Sri Lanka. The transformation from traditional to semi-industrial practices in the fishery has yet to be accompanied by adequate value addition, affecting the overall revenue generated from exports.

In terms of governance, the implementation of regulations faces challenges due to a lack of law enforcement, particularly concerning issues like night fishing, scuba diving, and unregulated farming. The ban on night diving, as stipulated in the gazette, needs to be more effectively enforced. Additionally, there needs to be more studies assessing the carrying capacity and maximum sustainable yield (MSY) of the sea cucumber population.

Identifying Stakeholders and Stakeholder Prioritization

High Importance / Low Influence	***High importance / High Influence***
1. *Marine Environment Protection Authority* 2. *National Aquatic Resources Research and Development Agency* 3. *Universities*	1. *Ministry of Fisheries* 2. *Department of Fisheries and Aquatic Resources* 3. *National Aquaculture Development Authority* 4. *Dept. of Coast Conservation & Coastal Resource Management* 5. *Sri Lankan Navy* 6. *Divers* 7. *Department of Wildlife Conservation* 8. *Forest Department* 9. *Sea Food Exporters* 10. *Central Environmental Authority* 11. *Rural Fishery Organisation* 12. *Divisional secretariats*
Low Importance / Low Influence	***Low Importance / High Influence***
1. *Processing Plant* 2. *Local government* 3. *Export Development Board* 4. *Meteorology Department*	1. *Temple* 2. *Church* 3. *Police* 4. *NGO* 5. *Women Societies*

Constitution of National Working Group

The group identified and ranked the following constituents for the NWG:

1. Ministry of Fisheries / Department of Fisheries
2. Ministry of Environment and affiliated Department
3. Rural Fisheries Organisation
4. Local/ District Govt Bodies
5. Coast Guard / Navy
6. Research and Academic Institutions
7. Non-governmental Organisation
8. Trade Bodies

4.4.3. Group III: Spiny Lobster Fishery

Brief about Spiny Lobster Fishery

Spiny Lobsters are one of the most valuable and economically important crustacean species found in Sri Lanka. It is used for export. Major fishery is located in the south coast of Sri Lanka from Tangalle to Amaduwa in Hambanthota District and adjacent coastal region of the Ampara district. This fishery is very popular among the south coast small-scale artisanal fishers, especially in the Hambanthota District. Approximately 4000 people depend on the fishery directly or indirectly.

Among the five species of lobsters recorded along the coast of Hambanthota District, Palinurus homarus is the most dominant species, contributing more than 70 percent to the catch. Over-exploitation of resources and declining income would create negative consequences on the

ecosystem and the socio-economic condition of the fish. The fishery is managed under a set of regulations, including the fisheries co-management mechanism established under the FAO CIDA-funded CENARA project.

Issues and Threat

Overfishing is a prominent concern, exacerbated by destructive fishing methods such as the use of bottom-set gill nets. It contributes to habitat loss through sedimentation and degradation of favorable environments for spiny lobsters. The effects of climate change, pollution, and erosion further compound the challenges faced by this fishery.

In terms of human well-being, the negative consequences are significant. Low income and livelihood threats are prevalent due to overfishing and habitat loss, and fishermen are susceptible to price fluctuations in the market. The lack of social protection measures leaves communities vulnerable to economic shocks. Conflicts with other stakeholders and loss of beach access and landing sites further strain the socio-economic fabric of the community.

Poor compliance and enforcement of regulations, including closed seasons, minimum legal sizes (MLS), and protection of berried females, contribute to overfishing and habitat degradation. Stock assessment needs to be improved for informed decision-making. Poor coordination among stakeholder groups and frequent policy changes further exacerbates the challenges faced by the fishery.

Identifying Stakeholders and Stakeholder Prioritization

High Importance / Low Influence	***High importance / High Influence***
1. *Lobster Collector* 2. *Fishers* 3. *Hotels* 4. *Universities* 5. *National Aquatic Resources Research and Development Agency*	1. *Ministry of Fisheries* 2. *Department of Fisheries and Aquatic Resources* 3. *Exporters* 4. *Sri Lankan Navy* 5. *Sri Lankan Coast Guard* 6. *Rural Fishery Organisation* 7. *Divers* 8. *Department of Coast Conservation and Coastal Resource Management*
Low Importance / Low Influence	***Low Importance / High Influence***
1. *NGOs* 2. *Forest Department* 3. *Central Environmental Authority* 4. *Safari Boat Owners*	1. *Marine Environment Protection Authority* 2. *Department of Wildlife Conservation* 3. *Local authority* 4. *Politician*

Constitution of National Working Group

The group identified and ranked the following constituents for the NWG:

1. Rural Fisheries Organization
2. Ministry of Fisheries / Department of Fisheries
3. Research and Academic Institutions
4. Coast Guard / Navy
5. Local/ District Govt Bodies
6. Ministry of Environment and affiliated Department
7. Non-governmental Organization
8. Trade Bodies
9. Exporters

4.4.4. Group IV: Puttalam Lagoon

Brief about Puttalam Lagoon

Puttalam Lagoon is considered one of the most productive 'basin estuaries' in Sri Lanka. Scattered among 88 fishing villages around the lagoon are about 165,000 people directly or indirectly dependent on Puttalam lagoon fisheries, including nearly 6,000 fishing directly in the lagoon. Located in the Northwestern Province of Sri Lanka, Puttalam lagoon extends over 32,750 ha and is connected to three river basins - Kala Oya, Mi Oya and Moongil Ara.

The aquatic habitats of the Puttalam Lagoon area are occupied by marine and brackishwater species of fish and shellfish, which are essential resources for the people living in the area as their main livelihood. The commonly harvested finfish species are the shad (Nematolosa nasus), grey mullet (Mugil cephalus), milkfish (Chanos chanos), sardines (Sardinellla spp.) and ponyfish (Leiognathus spp.).

Issues and Threat

The lagoon experiences reduced boat movement, leading to high bycatch rates and increased conflicts among users. This has a direct impact on women who may be deprived of their catch. The use of illegal fyke nets is prevalent, with an estimated 1000 nets in operation. This contributes to high turbidity and salinity fluctuations in the lagoon. Additionally, the presence of unregulated aquaculture facilities and salt pans further affects the ecological balance of the lagoon. Pollution has adverse effects on the well-being of the communities dependent on the lagoon. Furthermore, jellyfish stings pose a direct threat to the safety of individuals engaged in fishing and related activities.

While plans are in place for the management of Puttalam Lagoon, the overall governance needs to improve. Fisheries societies have been established, and a Lagoon Management Committee, including the district secretary, is in operation. However, the presence of illegal fyke nets and the impact of aquaculture facilities highlight areas for improvement in the enforcement of regulations and the overall management of the lagoon. Strengthening governance measures is crucial to ensure the sustainability of the Puttalam Lagoon and the well-being of the communities dependent on it.

Identifying Stakeholders and Stakeholder Prioritization

High Importance / Low Influence	***High importance / High Influence***
1. *Agriculture Department* 2. *NGOs* 3. *INSEE Cement* 4. *Academic Institutions* 5. *Puttalam Salt Ltd* 6. *Hotel Association*	1. *Department of Fisheries and Aquatic Resources* 2. *National Aquatic Resources Research and Development Agency* 3. *Lagoon Management Committee* 4. *National Aquaculture Development Authority* 5. *Department of Coast Conservation and Coastal Resource Management* 6. *Department of Wildlife Conservation* 7. *Police* 8. *Central Environmental Authority* 9. *Sri Lankan Navy* 10. *Forest Department*
Low Importance / Low Influence	***Low Importance / High Influence***
1. *Geological Survey & Mines Bureau* 2. *Irrigation Department*	1. *Ceylon Electricity Board* 2. *Water sport Society* 3. *Sri Lanka Tourism Development Authority*

Constitution of National Working Group

The group identified and ranked the following constituents for the NWG:

1. Ministry of Fisheries / Department of Fisheries
2. Rural Fisheries Organisation
3. Local/ District Govt Bodies
4. Coast Guard / Navy
5. Research and Academic Institutions
6. Ministry of Environment and affiliated Department
7. Non-governmental Organisation
8. Trade Bodies

5. Assessing Capacity Development Needs and Training

As developing the capacity of different levels of stakeholders is an essential component of the EAFM process, the participants were guided to assess the capacity needs for planning and implementing EAFM. A matrix was adopted for the exercise, with three levels of capacity needed for four levels of stakeholders. Each participant provided opinion on the level of capacity of the stakeholders. The final result is tabulated below by taking into consideration the frequency of participants' views in the matrix.

Level of capacity of the stakeholders

Capacity	Mid-level Managers	Research Institutions/ Academia	Non-government Organisations	Senior leaders, Executives, Decision makers
Knowledge				
• *Knowledge base*	Medium	High	Medium	Medium
• *Use of knowledge*	Poor	Medium	Poor	High
• *Access to knowledge*	Poor	High	Medium	Medium
Decision-making				
• *Evidence-based?*	Poor	High	Medium	High
• *Involvement of stakeholders*	Medium	Poor	High	Medium
• *Uptake of advice*	Poor	Medium	Poor	Medium
Transparency				
• *Implementation*	Medium	poor	poor	High
• *Attitude*	High	Medium	Medium	Medium
• *Cooperation*	Medium	Medium	Poor	Medium
• *Communication*	High	Poor	Poor	Medium

The capacity assessment reveals varying needs across the stakeholder categories in the EAFM process. While the attitude and communication capacity of mid-level managers are high, their access to and use of knowledge could be poor. The knowledge base and access to knowledge is high for research institutions and academia, but their involvement with stakeholders and communication capacity are poor. Regarding non-government organizations, their involvement with stakeholders is high. Senior leaders and decision-makers are attributed as having capacity for evidence-based decision-making, emphasizing a focus on effective implementation and communication. Transparency levels vary, with mid-level managers having high cooperation and senior leaders displaying positive attitudes, underlining diverse training needs for successful EAFM implementation.

6. Closing Session

In the Closing Session, the Director, BOBP-IGP briefed the Next Steps of planning and implementing EAFM in Sri Lanka. After a brief discussion and Vote of Thanks, the Workshop was closed at 4.30 pm.

7. Next Steps

- ***Identification of Project FMUs:*** *The Ministry of Fisheries, Sri Lanka will be requested to finalize any TWO FMUs from the prioritized FMUs for planning and implementing EAFM. If the government can support the third FMU in terms of arranging local logistics in the suggested site, the BOBLME project team will take up all the THREE FMUs for implementation, simultaneously.*
- ***Preparation of Scoping Report*** *on characterization, identification of issues, stakeholders, and capacity development needs for each FMU after final selection of the FMUs.*
- *BOBP-IGO shall engage a National Consultant and work closely with NARA to plan and implement the selected FMUs.*
- ***Constitution of the National Working Group*** *will be finalized in consultation with the Government.*
- ***Communicatio****n with experts, institutions and government will be taken up for active follow-up of the project activities.*

8. Epilogue

The workshop provided an excellent impetus to kickstart the EAFM program in Sri Lanka and helped identify a range of options for action. It offered an opportunity to understand the issues and threats, the categories of stakeholders to be considered for planning and implementing EAFM, and identifying the capacity development needs and potential constituents of the National Working Group-EAFM.

It is recognized that the planning and implementation of EAFM need to strengthen collaboration and cooperation among the stakeholders. It is, therefore, necessary to identify opportunities that are of mutual interest and to communicate the importance of engagement.

All the participants extended full cooperation and were focused on the objective of the consultation process. Many participants had sound knowledge on the proposed EAFM sites and contributed to the group activities and discussions.

Acknowledgments

Thanks are due to the Ministry of Fisheries, Government of Sri Lanka, for approving and coordinating the Workshop; NARA for organizing the event; and all the participants for their cooperation and active participation.

ANNEX I

Workshop Agenda

Date & Time	Agenda Item	Person/Venue
Day 1	***Date: 16 January 2024***	
0915 – 1115	***Session 1: Opening Session / EAFM Overview***	
0915 – 0945	Registration	
0945 – 0950	Welcome	NARA
0950 – 1010	Context and Approach of the Workshop	BOBP-IGO
1010 – 1030	EAFM – Overview	BOBP-IGO
1030 - 10.40	Special Remarks	NARA
1040 – 1115	***Group Photograph/Refreshments***	
1115 – 1630	***Session 2: Identifying Potential EAFM Units in Sri Lanka***	
1115 – 1135	Moving towards EAFM – Examples	Expert (SRL)
1135 – 1300	Short-listing Potential EAFM sites	Breakout groups
1300 – 1400	***Lunch***	
1400 – 1500	Presentation of Group Reports	Delegates
1500 – 1600	Prioritization of Sites using AHP Tool	Breakout Groups
1600 - 1630	***Refreshments***	
Day 2	***Date: 17 January 2024***	
0915 – 1100	Prioritization of Sites using AHP Tool *(continued)*	Delegates
1100 – 1130	***Refreshments***	
1100 – 1130	Presentation of Group Reports & Discussion	Delegates
1130 – 1530	***Session 3:*** ***Scoping of EAFM Plan Development & Implementation in Selected FMUs***	
1130 – 1220	Group Exercise • Identifying & Prioritising Issues and Threats • Identifying Stakeholders	Breakout groups
1220 – 1300	Presentation of Group Reports & Discussion	Delegates
1300 – 1400	***Lunch***	
1400 – 1450	Group Exercise • Identifying Institutions & Individuals for Constitution of Working Group • Assessing Capacity Development Needs and Training	Breakout groups
1450 – 1530	Presentation of Group Reports & Discussion	Delegates
1530 – 1600	***Session 4: Closing Session***	
1530 – 1550	Way Forward & Closing Remarks	BOBP-IGO
1550 – 1600	Vote of Thanks	BOBP-IGO
1530 - 1600	***Refreshments***	

ANNEX II

List of Participants

No.	Name	Designation
1.	Mr. H.M.K.J.B. Gunarathne	Additional Secretary, MoFAR
2.	Mr. Amal Mallikarachchi	Assistant Director, MoFAR
3.	Ms. Pravini Navarathne	Assistant Director, MoFAR
4.	Mr. M. Marcus	Director, DoFAR
5.	Mr. Sarath Chandranayaka	Assistant Director, DoFAR
6.	Mr. V. Kaliston	Assistant Director, DoFAR
7.	Mr. J Sudhakaran	Assistant Director, DoFAR
8.	Rukshan Croos	Assistant Director, DoFAR
9.	Ms. T.T Fernando	Senior Environmental Officer, CEA
10.	Dr. Ajithh Gunawardena	Deputy Director (R&D) CEA
11.	Mr. U.H. Wanniarachchi	Assistant Director, DCC&CRMD
12.	Ms. J.W.G. Priyanjana	Wildlife Ranger, Dept of Wildlife
13.	Mr. H.T.N.I Piyadasa	AD Manager, MEPA
14.	Mr. Wasantha	Dept of Forest
15.	Prof. K.H.M Asoka Deepanda	Senior Lecturer
16.	Dr Kasun Bandara	Senior Lecturer
17.	Dr. J.B. Jayasiri	Senior lecturer, Ocean University
18.	Dr. Shamen Vidanage	Country Representative, IUCN
19.	Dr. Sandun Perera	Programme Coordinator, IUCN
20.	Prof. Oscar Amarasinghe	President, SLFSSF
21.	Dr. Sevvandi Jayakodi	Senior Lecturer, Wayamba University
22.	Ms. Chethana Lakshani	Blue Ocean Trust
23.	Mr. Arjan Rajasuriya	Coral Reef Expert
24.	Mr. R A. Ajith	Small Scale Fishermen society member
25.	Dr. Geevika	DDG, NARA
26.	Dr. P. Jayasinge	Principal Scientist, NARA
27.	Dr. S. Athukoorala	Senior Scientist, NARA
28.	Ms. K. Bahhdaranayake	Senior Scientist, NARA
29.	Mr Upul Liyanage	Senior Scientist, NARA
30.	Mr.S Premarathna	Scientist, NARA
31.	Ms. S. Kariyawasam	Scientist, NARA
32.	Mr. J. S. Jayanatha	Senior Scientist, NARA
33.	Ms. S. Gunasekara	Scientist, NARA
34.	Dr. P. Krishnan	Director, BOBP-IGO
35.	Mr. Rajdeep Mukherjee	Policy Analyst, BOBP-IGO
36.	Dr. E. Vivekanandan	International Consultant, BOBP-IGO
37.	Mr. Krishna Mohan	Secretary, BOBP-IGO
38.	Dr. Sri Hari M	Project Scientist, BOBP-IGO

Group-wise List of Participants

Group 1

No.	Name	Designation
1.	Mr. H.M.K.J.B. Gunarathne	Additional Secretary, MoFAR
2.	Mr. V. Kaliston	Assistant Director, DoFAR
3.	Dr. Ajith Gunawardena	Deputy Director (R&D) CEA
4.	Mr. Wasantha	Dept of Forest
5.	Dr. Shamen Vidanage	Country Representative, IUCN
6.	Ms. Chethana Lakshani	Blue Ocean Trust
7.	Dr. S. Athukorala	Principal Scientist, NARA
8.	Ms. S. Kariyawasam	Scientist, NARA

Group 2

No.	Name	Designation
1.	Mr. Amal Mallikarachchi	Assistant Director, MoFAR
2.	Mr. J Sudhakaran	Assistant Director, DoFAR
3.	Mr. U.H. Wanniarachchi	Assistant Director, DCC&CRMD
4.	Prof. K.H.M Asoka Deepanda	Senior Lecturer
5.	Dr. Sandun Perera	Programme Coordinator, IUCN
6.	Ms. K. Bahhdaranayake	Senior Scientist, NARA
7.	Mr. J.S. Jayanatha	Senior Scientist, NARA

Group 3

No.	Name	Designation
1.	Mr. M. Marcus	Director, DoFAR
2.	Rukshan Croos	Assistant Director, DoFAR
3.	Ms. J.W.G. Priyanjana	Wildlife Ranger, Dept of Wildlife
4.	Dr Kasun Bandara	Senior Lecturer
5.	Prof. Oscar Amarasinghe	President, SLFSSF
6.	Mr. R A. Ajith	Small Scale Fishermen society member
7.	Mr Upul Liyanage	Senior Scientist, NARA
8.	Ms. S. Gunasekara	Scientist, NARA

Group 4

No.	Name	Designation
1.	Mr. Sarath Chandranayaka	Assistant Director, DoFAR
2.	Ms. T.T Fernando	Senior Environmental Officer, CEA
3.	Mr. H.T.N.I Piyadasa	AD Manager, MEPA
4.	Dr. J.B. Jayasiri	Senior lecturer, Ocean University
5.	Dr. P. Jayasinge	Principal Scientist, NARA
6.	Mr.S Premarathna	Scientist, NARA
7.	Mr. Arjan Rajasuriya	Coral Reef Expert

Annex III

1

BOBLME I (2009-2015)

Transboundary Diagnostic Analysis (TDA)

- *Overexploitation of marine living resources,*
- *Degradation of critical habitats*
- *Pollution and water quality*
- *Climate change*

Strategic Action Programme (SAP): Implementation Phase - BOBLME II

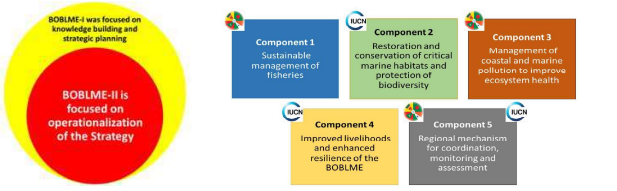
Key Barriers

- *Weak Institutional, legal and administrative frameworks at regional, national and community levels*
- *Socio-economic barriers*
- *Lack of integration of climate change resilience in planning and management*

2

BOBLME II (2023-2028)

Sustainable management of fisheries, marine living resources and their habitats in the Bay of Bengal region for the benefit of coastal states and communities



Time frame : 5 Years

3

BOBLME II – Project Partners

Funding	:	GEF & NORAD
Implementing Agency	:	FAO
Executing Agencies	:	IUCN, BOBP-IGO, SEAFDEC

BOBP-IGO will implement in Bangladesh, India, Maldives and Sri Lanka.

National execution partners

Ministries of Fisheries and Agriculture
Ministries of Environment
Other national agencies of the participating countries.

4

Expected Deliverables

*One of the major sub-components of **Component 1 is implementation of Ecosystem Approach to Fisheries Management (EAFM).***

Expected outcome

*By the end of the project period, **EAFM will be institutionalized at national level**, including targeted transboundary fish stocks.*

Expected outputs

*(i) At least **2 EAFM plans** implemented;*

*(ii) National and regional **platforms established** or strengthened to involve grassroot stakeholders in management decision-making, and*

*(iii) EAFM training **embedded in national and regional training institutions.***

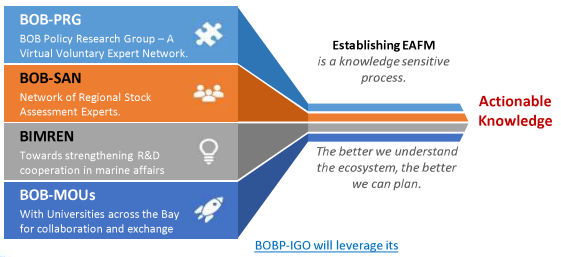
5

Role of Government

6

1

Establishing EAFM: *Leveraging Knowledge Networks*



BOBP-IGO will leverage its

Expert Networks | Experience in Co-management | National & Regional Processes.

7

Workshop Day 1

Selection of suitable pilot sites (Fishery Mgmt. Units) for EAFM implemention

EAFM is a holistic strategy aimed at balancing ecological well-being and human well-being by adopting good governance.

The project seeks to establish EAFM pilot Units to **demonstrate its efficacy and pave the way for broader adoption.**

Selecting the right pilot EAFM Units for EAFM implementation is a strategic step towards demonstrating its benefits and facilitating national adoption.

Two suitable sites for implementing EAFM in Sri Lanka will be identified through a consultative process.

8

Workshop Day 2

Scoping EAFM Plan Development & Implementation in the Selected FMUs

- After selecting the **potential EAFM pilot Units**, the process of developing and implementing EAFM plan has to be initiated.
- **Requirements:**
  - **prepare a scoping report on the pilot units;**
  - identify threats and issues;
  - **identify working groups for planning and implementation;**
  - identify the stakeholders;
  - network the institutions and individuals;
  - assess capacity development needs and training; and
  - **identify strategies to move towards EAFM by aligning with national policies.**

9

Workshop Objectives

- **Share information** on BOBLME Project;
- **Identify potential EAFM Units** for developing plans and implementation;
- **Initiate the process** of scoping EAFM planning and implementation in the identified pilot units; and
- **Establish partnerships** with and amongst stakeholders for future collaboration.

10

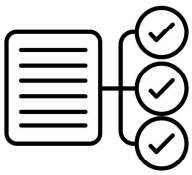
Workshop Methodology

- **Presentation** by resource persons
- **Interactions**
- **Break-out group activities**
- **Adopting Analytic Hierarchical Process**
- **Follow the criteria finalized in Expert Consultation Workshop**

11

Workshop Deliverables

- **Prioritized Units for implementing EAFM pilots in Sri Lanka.**
- **Identifying Institutions & Individuals for Constitution of Working Groups**
- **Assessing Capacity Development Needs and Training**



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Annex IV

National Consultation Workshop
Scoping EAFM Planning and Implementation Process in Sri Lanka's Bay of Bengal Region
NARA | 16-17 Jan 2024

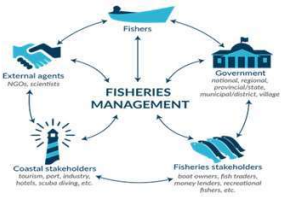
EAFM : An Overview

Dr. E.Vivekanandan
Independent Consultant, BOBP-IGO

1

Fisheries Management

"An integrated process that aims to minimize the impacts of issues and improve the benefits that society receives from harvesting fish"
(Source: FAO)



2

Issues and Threats to Fisheries

Fishery factors

- Overfishing
- Overcapacity
- Destructive fishing
- Unsustainable fishing
- Bycatch
- IUU fishing
- Ghost fishing

Non-Fishery factors

- Increasing land-use
- Pollution
- Habitat destruction
- Climate change

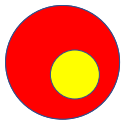
3

Need for inclusive approach: EAFM

Conventional fisheries management views **fish as a separate entity**

Does not cover all threats and issues

A broader and more **inclusive approach** is needed that expands on existing management



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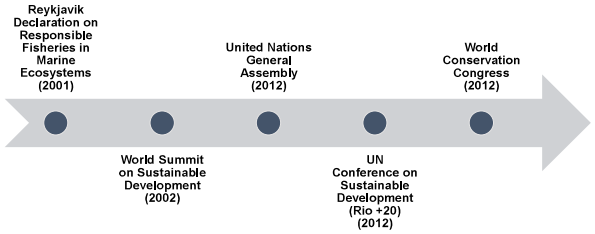
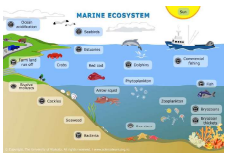
EAFM endorsed by



5

What is an Ecosystem ?

An ecosystem can be defined as a relatively self-contained system that contains plants, animals (**including humans**), micro-organisms and non-living components of the environment as well as the interactions between them." (SPC, 2010)



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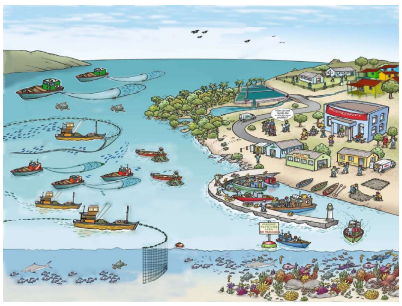


Fisheries ⇨ Ecosystem
the bigger picture

7

Ecosystem Approach

It is a strategy for **the integrated management** of land, water and living resources that promotes **conservation and sustainable use** in an equitable way (CBD 2000)

EA is often used interchangeably with ecosystem-based management (EBM)

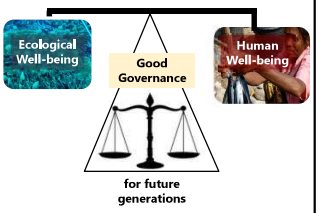
The ecosystem approach is the way to implement sustainable development.

8

Sustainable Development

*"Development which **meets the needs of the present without compromising the ability of future generations** to meet their own needs."*

Sustainable development is about **maximizing the ecosystem benefits** but at the same time not degrading the systems to the extent that the benefits cannot be sustained.



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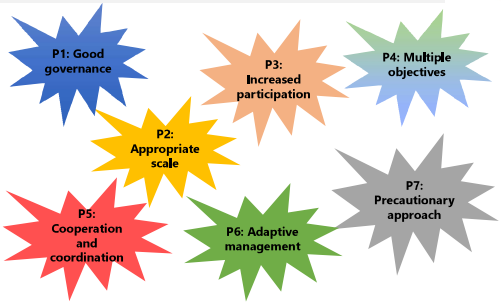
Key Principles of EAFM



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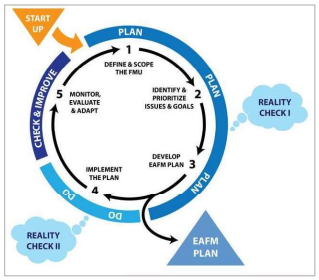
Five Steps of EAFM



11

Key Activities & Timeline

1. **Methodological** Framework Development
An expert consultation workshop was conducted in December 2023 by BOBP-IGO to develop the methodological framework for the selection of EAFM units.

2. **Scoping EAFM Planning**
Between January and April 2024, the National Workshop, involving BOBP-IGO and country institutions, will focus on scoping EAFM planning and implementation in the selected sites.

3. **Hiring of Consultants**
In February 2024, the procurement process will commence for hiring consultants under the supervision of BOBP-IGO.

4. **National Working Groups**
From February to July 2024, the formation of National Working Groups will be facilitated through consultation with governments and BOBP-IGO.

5. **Stakeholder Identification**
Between March and July 2024, efforts will be made to identify and formalize stakeholders in the 8 EAFM sites through consultations with National Working Groups.

6. **Stakeholder Capacity Development**
National training workshops will be conducted from May to July 2024 by the National Working Groups and BOBP-IGO to enhance the capacity of stakeholders.

7. **Scoping Document Preparation**
Preparation of a scoping document for the 8 Fishery Management Units is scheduled from March to August 2024 involving field data, secondary information, and relevant stakeholders.

8. **EAFM Plans Development**
From June to December 2024, need-based interactions with National Working Groups, stakeholders, and governments will take place to develop EAFM plans for the 8 EAFM units.

12

Co-management: Central part of EAFM

Increased participation of stakeholders in managing and conserving the resources and ecosystems is critical

Both the communities of local **resource users and the government share the responsibility** and authority for managing and determining the goals of the fishery, with various degrees of power sharing

The **rights and degree of empowerment of stakeholders** have an important role on decision making and implementation process

13

Key messages

Implementing EAFM takes time

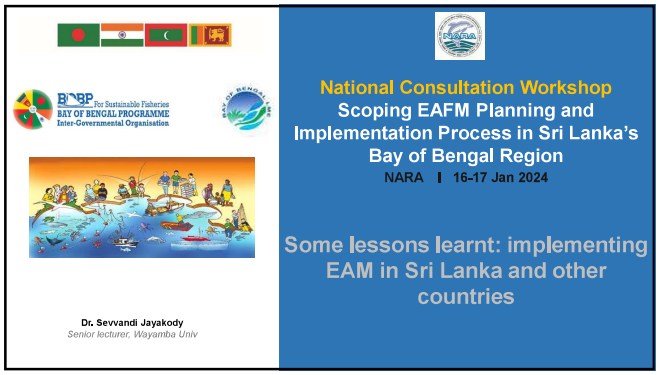
EAFM is an iterative process; lessons learned along the way

Many fisheries are doing EAFM in part

Moving towards EAFM does not require drastic change, but many small steps through time

14

Annex V



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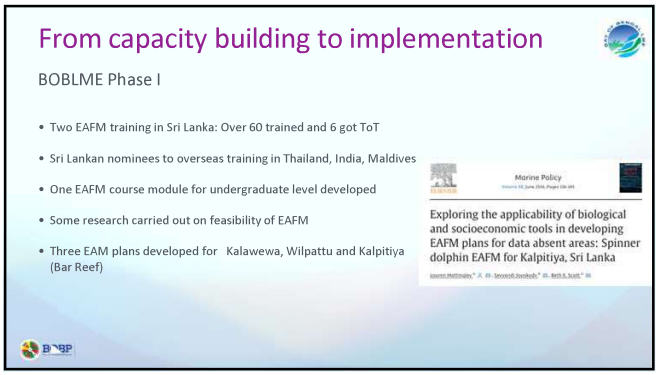

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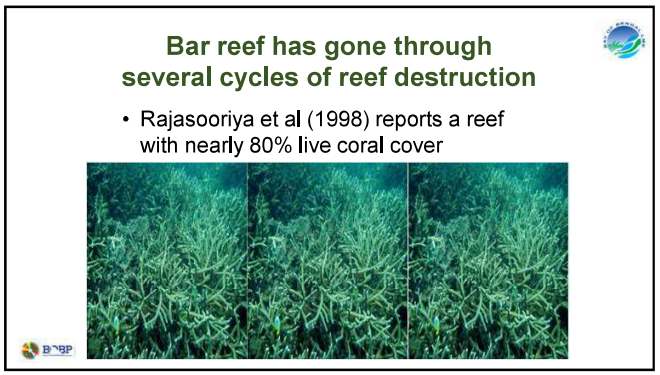

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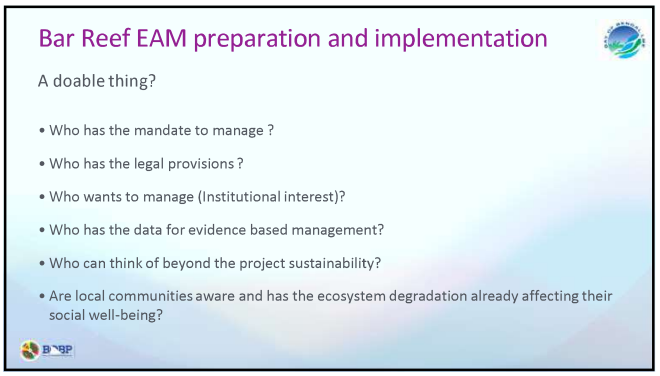

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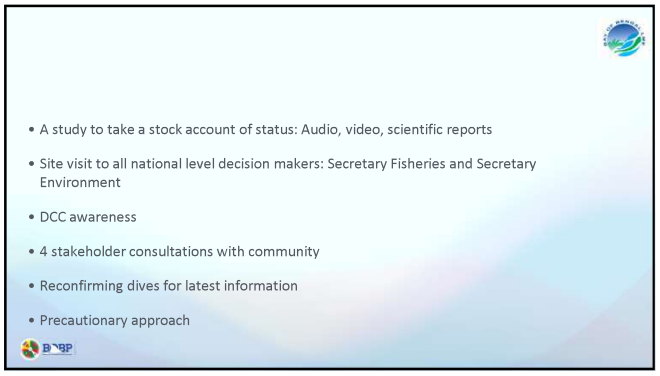

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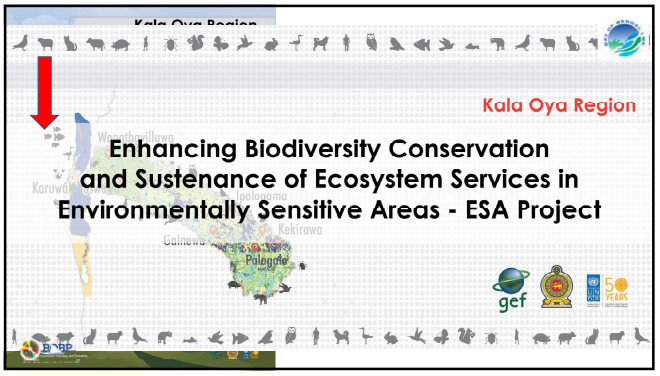

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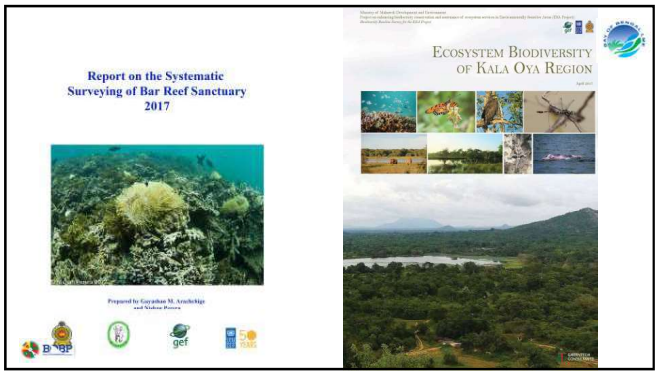
Report on the Systematic
Surveying of Bar Reef Sanctuary
2017
Ecosystem Biodiversity
of Kala Oya Region

7

Sachini Tourism

8

9

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ORCA 2018

11

P141
ORCA 2018

12

Outcomes

- Local level official and communities are very keen to link
- Provided a platform of win -win decision making
- High local level interest on co- management
- Very high local interest on management committee and its implementation
- The management plan was nationally validated with a promise to execute rather than display on a cupboard

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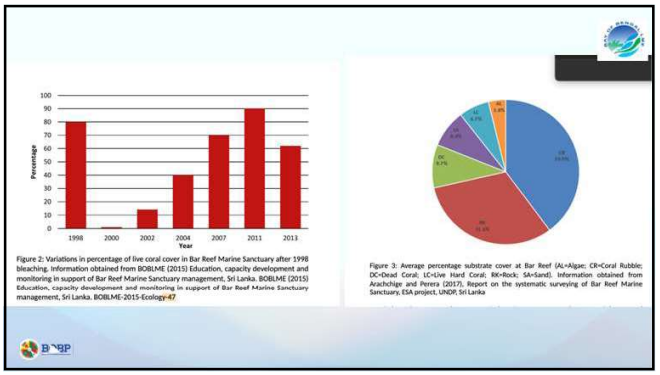

Figure 2: Variations in percentage of live coral cover in Bar Reef Marine Sanctuary after 1998 bleaching. Information obtained from BOBLME (2015) Education, capacity development and monitoring in support of Bar Reef Marine Sanctuary management, Sri Lanka. BOBLME (2015) Education, capacity development and monitoring in support of Bar Reef Marine Sanctuary management, Sri Lanka. BOBLME-2015-Ecology-47

Figure 3: Average percentage substrate cover at Bar Reef (AL=Algae; CR=Coral Rubble; DC=Dead Coral; LC=Live Hard Coral; RK=Rock; SA=Sand). Information obtained from Arachchige and Perera (2017). Report on the systematic surveying of Bar Reef Marine Sanctuary, ESA project, UNDP, Sri Lanka

14

Importance : how importance a stakeholder is for management process
Influence : how much influence (power) a stakeholder has over management process

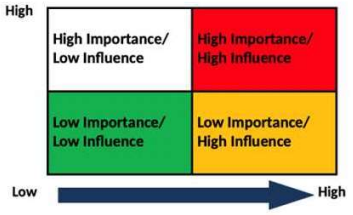

Figure 5: The 2×2 matrix schemes used in identifying the stakeholders

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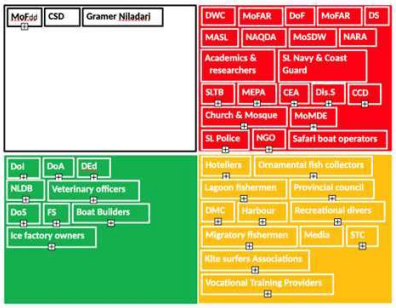

Figure 6: Outcomes of stakeholder analysis

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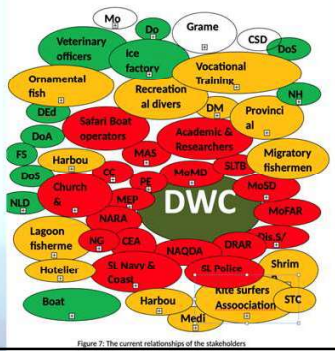

Figure 7: The current relationships of the stakeholders

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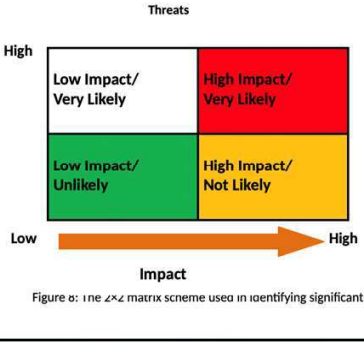
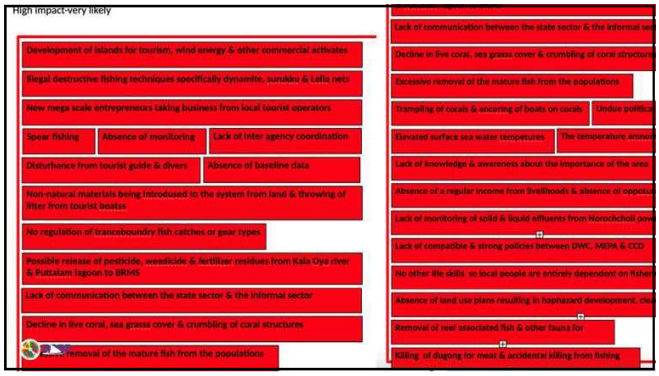


Figure 8: The 2×2 matrix scheme used in identifying significant

18



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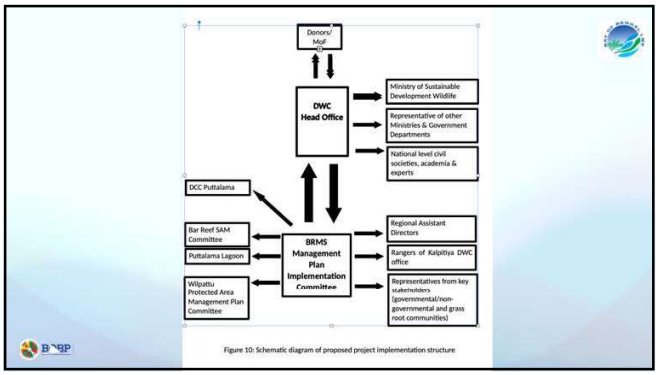

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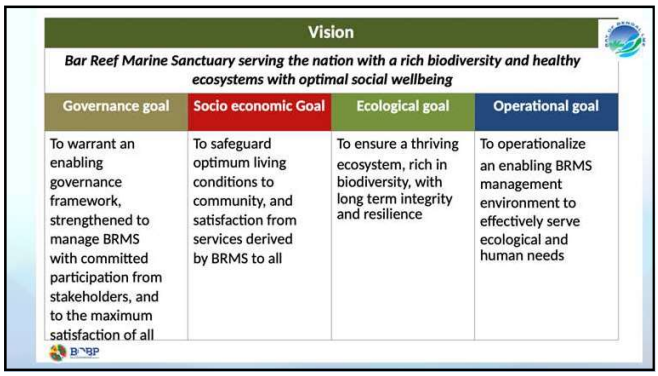

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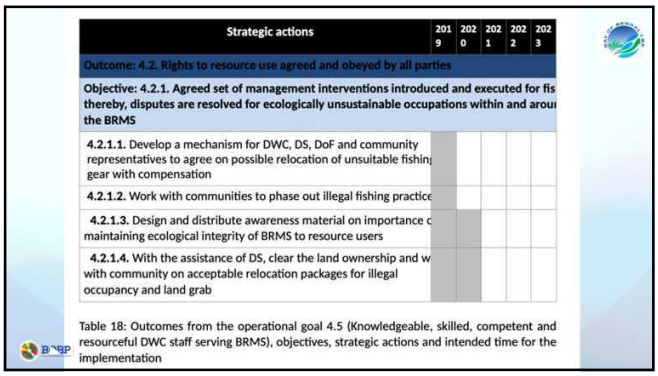

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Implementation: realities of implementation

2020-2022

- DWC included BRMP in EU funded COLIBRI Project
- But by then there were 3 management plans
- Decided on hybrid approach

23

Implementation: realities of implementation

2020-2022

- Bar Reef monitoring data continuation
- Social status data updating
- Awareness level survey
- Livelihoods, livelihood shifts and current status
- Legal knowledge and rights of people update

24

Implementation: realities of implementation

2020-2022

- Specialised training for obtaining licences
- Management unit reassessment
- Tourism potential and opportunities for restructuring

25

Vacuum

- Despite several attempts at local level, management committee was not appointed
- DWC and DoF agreed management actions were not implemented
- Lagoon fishery related data and trawl g data in the area not compiled
- Despite training and providing equipment formal appointment of local communities as " eyes over ocean" did not materialise
- Without co-management committee decision making again became compartmentalised

26

Lessons from Sudan

- EAFM trainings from top to bottom level
- Data at minimal level
- Started small (FMU) , showing the success and expanding
- Very high co-management
- Data gathering tied to local institutes
- At each location plan preparation, implementation is concurrent
- Several precautionary approaches

27

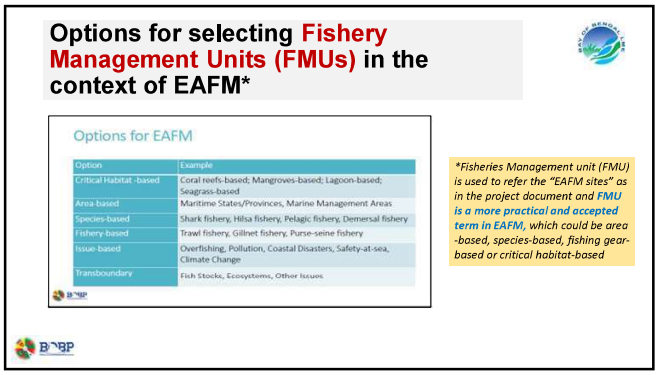
Lesson for today's exercise and implementation of FMU

- Stakeholders willingness and implementors willingness should match
- Lack of data is not an issue to START
- Legal synergies should be discussed and agreed upon
- Conflicts should be discussed both at national and local level and resolved concurrently so that agreed decisions can be incorporated
- Staff turn over topples the implementation
- FMU should capture realities and ghost players

28

Annex VI

1



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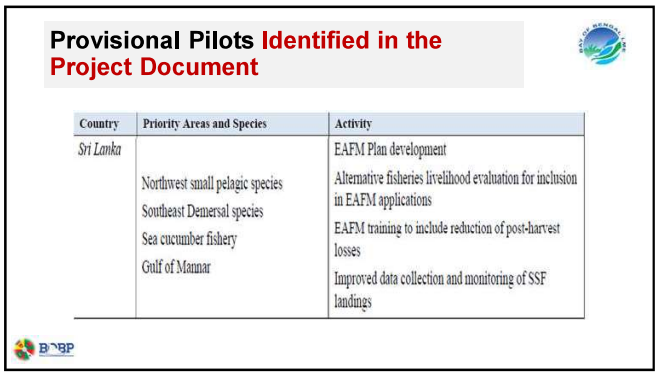

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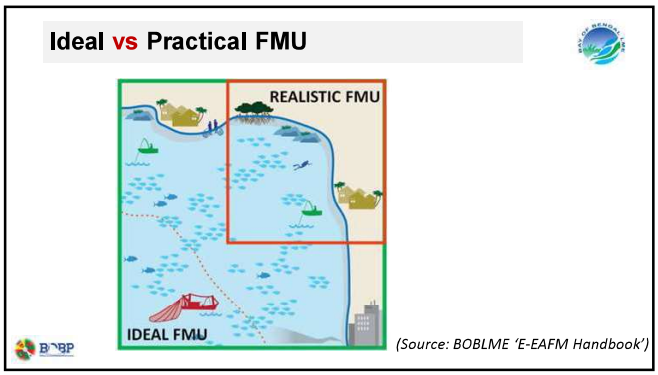

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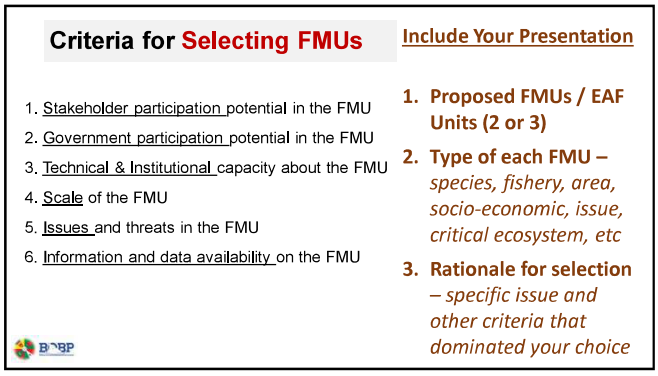

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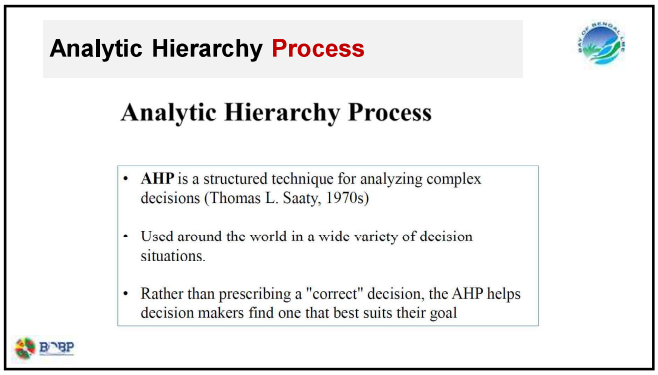
Annex VII

1



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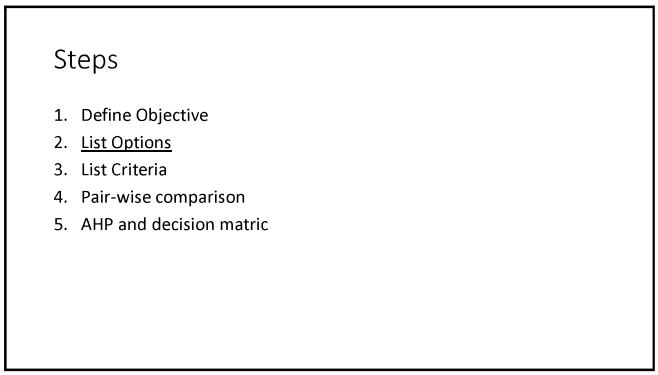

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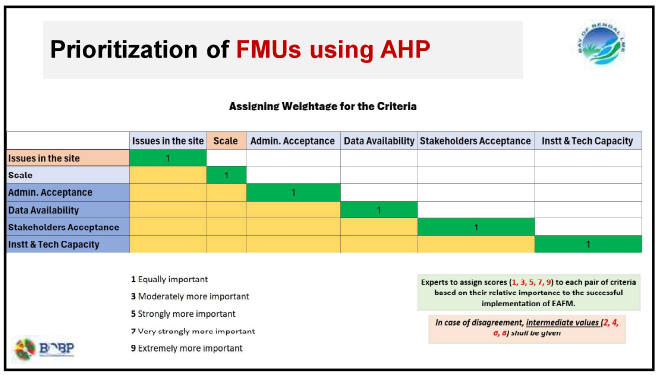

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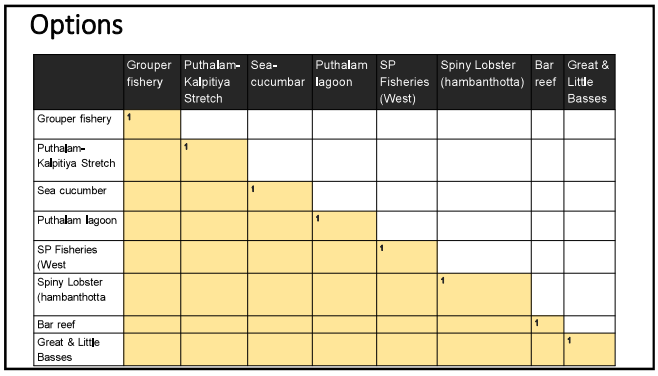

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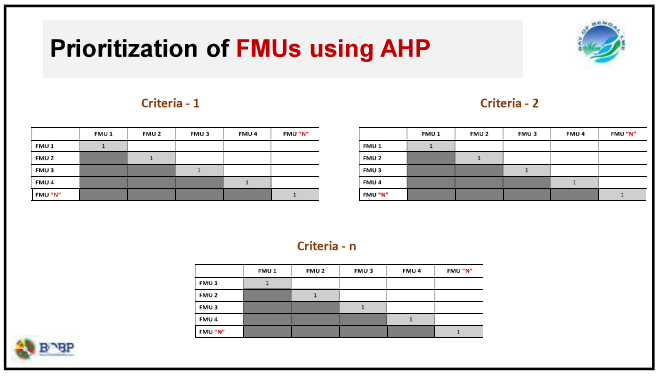


6

Criteria for FMU Prioritization

#	Criteria	Weightage	Application of criteria for prioritization
1	**Stakeholder participation**	**0.374**	In FMUs where stakeholders are highly receptive and willing to participate in the initiatives to improve management measures may be prioritized. For e.g., in FMUs/sites where a formal or informal co-management arrangement already exists, the implementation would be fairly smoother and successful.
2	**Government participation**	**0.312**	FMUs with high levels of government interest and investment will be acceptable to the governments for implementing EAFM have a priority
3	**Technical & Institutional capacity**	**0.180**	FMUs, where institutions are already working and have good knowledge and capacity, it will provide an impetus to the entire process have a priority
4	**Scale**	**0.064**	FMUs have to be prioritized based on the potential of the project to implement within practical scales and boundaries
5	**Issues in the FMU**	**0.044**	Potential of the project to find solutions to the issues and implement considering the limited human and monetary resources and time availability need to be considered.
6	**Information/Data availability**	**0.026**	FMUs having enough data/information are in an advantageous position to begin action. They have priority over others.

7

Identifying and Prioritizing Issues & Threats

EAFM Components	Definition	Impacting Issues
Ecosystem well-being	All ecological assets relevant to the fishery (stocks, biodiversity, habitats)	Unsustainable fishing, pollution, habitat loss, climate change
Human well-being	Social and/or economic "outcomes" currently being generated by the fishery, both the good (e.g., food security and economic development) and the bad (e.g. conflicts and injuries)	Unprofitable fishing, gender issues, poor human health infrastructure, conflicts, climate change related issues and natural disasters, aspirations to adopt technological advances
Good governance	Management and institutional "systems" in place, to deliver the wanted outcomes (e.g. access and tenure systems, compliance, democratic processes, conflict resolution, institutional arrangements)	Weak resource management, open access regimes, economic development vs conservation, lack of proper planning, negative consequences of subsidies, lack of decentralisation, stakeholder participation and co-management, weak institutional capacity and infrastructure, poor compliance and enforcement

8

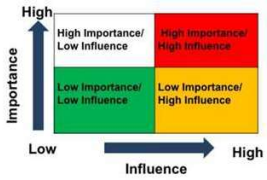
Identifying stakeholders

A stakeholder is any individual, group or organization which has an interest and involved in or which can affect or is affected, positively or negatively, by the EAFM process.

9

Stakeholder prioritization (continued)

Analysis using a 2x2 matrix where stakeholders are plotted according to (i) how important the stakeholder is to the EAFM process on Y axis and how much influence (power) they have over the EAFM process on X axis.



10

Identifying Institutions & Individuals for Constitution of National Working Group

Working Group is a small number of stakeholders (**perhaps four or five depending on the prioritization process**) representing the community, institutions and management agencies who will **work with the Project Team** to guide the EAFM process after Startup.

WG is crucial as it engages with, **gives responsibility and power to the community members**, and works through the planning and implementation process.

11

Identifying Institutions & Individuals for Constitution of National Working Group

The WG will serve to:

- ***Develop*** dialogue and stimulate EAFM discussion;
- ***Facilitate*** community organization;
- ***Help*** stakeholders understand EAFM;
- ***Identify*** problems, issues, and opportunities in engaging stakeholders;
- ***Assist*** in decision-making within an EAFM process;
- ***Identify*** other stakeholders and stakeholder groups; and
- ***Gather*** and spread information among community members.

12

Assessing Capacity Development Needs and Training

Mid-level managers and fishery and environment staff, related economic development and planning staff at the provincial/state and district/local levels who are **responsible for administering or managing fisheries and the marine environment**

Non-Government Organisations, research institutions and academia

Leaders, executives, and decision makers (LEAD) training aims to provide senior-level leaders with an understanding and forum for discussion of the why, what and how to implement EAFM

13

Matrix for assessing capacity for planning and implementing EAFM*

Capacity	Mid-level Managers	Research Institutions/ Academia	Non-government Organisations	Senior leaders, Executives, Decision makers
Knowledge				
- Knowledge base				
- Use of knowledge				
- Access to knowledge				
Decision-making				
- Evidence-based?				
- Involvement of stakeholders				
- Uptake of advise				
- Transparency				
Implementation				
- Attitude				
- Cooperation				
- Communication				

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Bay of Bengal Programme
Inter-Governmental Organisation
91, Saint Mary's Road, Abhiramapuram
Chennai - 600 018, Tamil Nadu, India
Telephone: # 91 44 42040024
www.bobpigo.org
Email: info@bobpigo.org

We look forward to work together in areas of mutual interest...

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Annex VIII

AHP Analyser
Project Prioritization

Pairwise Comparison by Filling Judgement Values

Group Name : GROUP1

Members : SA, AJ, CL, HG, VK

Goal : TO PRIORITIZE FMU IN SRI LANKA

Project Options Table

SNO	Options	Abbreviation/Code
1	GROUPER FISHERY	GF
2	PUTTALAM KALPITIYA STRETCH	KPS
3	SEA CUCUMBER GULF OF MANNAR	SCGM
4	PUTLAM LAGOON	PL
5	SMALL PELAGIC FISHERIES WEST COAST	SPFW
6	SPINY LOBSTER HAMBANTOTA	SLH
7	GREAT AND LITTLE BASSES	GLB

Evaluation Criteria Table

SNO	Criteria	Abbreviation/Code
1	ISSUES IN SITE	IIS
2	SCALE	SL
3	ADMIN ACCEPTANCE	AA
4	DATA AVAILABILITY	DA
5	STAKEHOLDERS ACCEPTANCE	SA
6	INSTITUTIONAL AND TECH CAPACITY	ITC

Selection of judgement values by the team on the basis of fundamental scale

Step-1: Criteria with respect to Goal: TO PRIORITIZE FMU IN SRI LANKA

	IIS	SL	AA	DA	SA	ITC	Eigen Vector	Weight	Comp Eigen Vector
IIS	1	1/3	1/7	5	1/7	1/7	0.4116	0.0443	0.3203
SL	3	1	1/7	5	1/7	1/7	0.5936	0.0639	0.4515
AA	7	7	1	8	1/2	3	2.8944	0.3116	2.0053
DA	1/5	1/5	1/8	1	1/6	1/4	0.2435	0.0262	0.1941
SA	7	7	2	6	1	3	3.476	0.3742	2.4515
ITC	7	7	1/3	4	1/3	1	1.6711	0.1799	1.2706

λmax = 6.6933 **Consistency Index** = 0.1387 **Consistency Ratio** =0.1118

Step- 2: Options with respect to ISSUES IN SITE

	GF	KPS	SCGM	PL	SPFW	SLH	GLB	Eigen Vector	Weight	Comp Eigen Vector
GF	1	7	5	7	7	1/3	9	3.39	0.2992	2.5308
KPS	1/7	1	1/5	3	3	1/3	9	0.9636	0.085	0.6927
SCGM	1/5	5	1	5	3	1/5	9	1.6013	0.1413	1.2246
PL	1/7	1/3	1/5	1	3	1/7	9	0.6238	0.055	0.4568
SPFW	1/7	1/3	1/3	1/3	1	1/7	9	0.4902	0.0433	0.3524
SLH	3	3	5	7	7	1	9	4.111	0.3628	3.0308
GLB	1/9	1/9	1/9	1/9	1/9	1/9	1	0.1521	0.0134	0.123

λmax =8.4111 **Consistency Index** = 0.2352 **Consistency Ratio** =0.1782

Step- 3: Options with respect to SCALE

	GF	KPS	SCGM	PL	SPFW	SLH	GLB	Eigen Vector	Weight	Comp Eigen Vector
GF	1	9	7	7	7	1/3	9	3.6869	0.3482	3.6207
KPS	1/9	1	1/5	3	5	5	9	1.4724	0.1391	1.931
SCGM	1/7	5	1	5	5	1/5	9	1.6417	0.1551	1.5962
PL	1/7	1/3	1/5	1	3	1/5	9	0.6545	0.0618	0.492
SPFW	1/7	1/5	1/5	1/3	1	1/5	9	0.4445	0.042	0.3483
SLH	3	1/5	5	5	5	1	9	2.5362	0.2395	2.7354

GLB	1/9	1/9	1/9	1/9	1/9	1/9	1	0.1521	0.0144	0.1239

λmax =10.8476 **Consistency Index** = 0.6413 **Consistency Ratio** =0.4858

Step- 4: Options with respect to ADMIN ACCEPTANCE

	GF	KPS	SCGM	PL	SPFW	SLH	GLB	Eigen Vector	Weight	Comp Eigen Vector
GF	1	7	1/3	7	7	1/3	9	2.3024	0.2304	2.1846
KPS	1/7	1	1/3	3	3	1/3	9	1.0366	0.1037	0.8402
SCGM	3	3	1	3	3	3	9	3	0.3002	2.4909
PL	1/7	1/3	1/3	1	3	1/3	9	0.7573	0.0758	0.6195
SPFW	1/7	1/3	1/3	1/3	1	1/3	9	0.5533	0.0554	0.4582
SLH	3	3	1/3	3	3	1	9	2.1918	0.2193	1.8521
GLB	1/9	1/9	1/9	1/9	1/9	1/9	1	0.1521	0.0152	0.1246

λmax =8.5703 **Consistency Index** = 0.2617 **Consistency Ratio** =0.1983

Step- 5: Options with respect to DATA AVAILABILITY

	GF	KPS	SCGM	PL	SPFW	SLH	GLB	Eigen Vector	Weight	Comp Eigen Vector
GF	1	3	1/3	1/3	1/3	1/3	9	0.8548	0.0891	0.7037
KPS	1/3	1	1/3	1/3	1/3	1/3	9	0.6245	0.0651	0.5141
SCGM	3	3	1	1/3	1/3	1/3	9	1.1699	0.1219	0.9631
PL	3	3	3	1	3	3	9	3	0.3127	2.4697
SPFW	3	3	3	1/3	1	1/3	9	1.6013	0.1669	1.3183
SLH	3	3	3	1/3	3	1	9	2.1918	0.2284	1.8044
GLB	1/9	1/9	1/9	1/9	1/9	1/9	1	0.1521	0.0159	0.1252

λmax =7.8985 **Consistency Index** = 0.1498 **Consistency Ratio** =0.1135

Step- 6: Options with respect to STAKEHOLDERS ACCEPTANCE

	GF	KPS	SCGM	PL	SPFW	SLH	GLB	Eigen Vector	Weight	Comp Eigen Vector
GF	1	7	3	5	5	3	9	3.9181	0.3813	2.9974
KPS	1/7	1	1/3	3	3	1/3	9	1.0366	0.1009	0.8131

SCGM	1/3	3	1	3	3	3	9	2.1918	0.2133	1.6453
PL	1/5	1/3	1/3	1	3	1/3	9	0.7946	0.0773	0.613
SPFW	1/5	1/3	1/3	1/3	1	1/3	9	0.5805	0.0565	0.4484
SLH	1/3	3	1/3	3	3	1	9	1.6013	0.1558	1.1914
GLB	1/9	1/9	1/9	1/9	1/9	1/9	1	0.1521	0.0148	0.1243

λmax =7.8329 **Consistency Index** = 0.1388 **Consistency Ratio** =0.1052

Step- 7: Options with respect to INSTITUTIONAL AND TECH CAPACITY

	GF	KPS	SCGM	PL	SPFW	SLH	GLB	Eigen Vector	Weight	Comp Eigen Vector
GF	1	7	1/3	5	5	1/3	9	2.0914	0.2121	1.9099
KPS	1/7	1	1/3	3	1/3	1/3	9	0.7573	0.0768	0.6348
SCGM	3	3	1	3	3	1/3	9	2.1918	0.2223	1.8367
PL	1/5	1/3	1/3	1	1/3	1/3	9	0.5805	0.0589	0.478
SPFW	1/5	3	1/3	3	1	1/3	9	1.0876	0.1103	0.874
SLH	3	3	3	3	3	1	9	3	0.3042	2.4841
GLB	1/9	1/9	1/9	1/9	1/9	1/9	1	0.1521	0.0154	0.1248

λmax =8.3422 **Consistency Index** = 0.2237 **Consistency Ratio** =0.1695

Final Priority

GROUPER FISHERY	0.2904
PUTTALAM KALPITIYA STRETCH	0.0982
SEA CUCUMBER GULF OF MANNAR	0.2327
PUTLAM LAGOON	0.0777
SMALL PELAGIC FISHERIES WEST COAST	0.0672
SPINY LOBSTER HAMBANTOTA	0.2187
GREAT AND LITTLE BASSES	0.015

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AHP Analyser
Project Prioritization

Pairwise Comparison by Filling Judgement Values

Group Name : GROUP 2

Members : SP AD KB JS ES AM UH

Goal : TO PRIORITISE PILOT FMUS FOR IMPLEMENTATION OF EAFM IN SRI LANKA

Project Options Table

SNO	Options	Abbreviation/Code
1	GROUPER FISHERY	GF
2	PUTTALAM KALPITIYA STRETCH	KPS
3	SEA CUCUMBER	SC
4	PUTTALAM LAGOON	PL
5	SMALL PELAGICS FISHERIES WEST COAST	SPFW
6	SPINY LOBSTER HAMBANTOTA	SLH
7	GREAT AND LITTLE BASSES	GLB

Evaluation Criteria Table

SNO	Criteria	Abbreviation/Code
1	ISSUES IN THE SITE	IIS
2	SCALE	SL
3	ADMIN ACCEPTANCE	AA
4	DATA AVILABILITY	DA
5	STAKEHOLDER ACCEPTANCE	SA
6	INSTITUTIONAL AND TECH CAPACITY	ITC

Selection of judgement values by the team on the basis of fundamental scale

Step-1: Criteria with respect to Goal: TO PRIORITISE PILOT FMUS FOR IMPLEMENTATION OF EAFM IN SRI LANKA

	IIS	SL	AA	DA	SA	ITC	Eigen Vector	Weight	Comp Eigen Vector
IIS	1	1/3	1/7	5	1/7	1/7	0.4116	0.0443	0.3203
SL	3	1	1/7	5	1/7	1/7	0.5936	0.0639	0.4515

AA	7	7	1	8	1/2	3	2.8944	0.3116	2.0053
DA	1/5	1/5	1/8	1	1/6	1/4	0.2435	0.0262	0.1941
SA	7	7	2	6	1	3	3.476	0.3742	2.4515
ITC	7	7	1/3	4	1/3	1	1.6711	0.1799	1.2706

λmax = 6.6933 **Consistency Index** = 0.1387 **Consistency Ratio** =0.1118

Step- 2: Options with respect to ISSUES IN THE SITE

	GF	KPS	SC	PL	SPFW	SLH	GLB	Eigen Vector	Weight	Comp Eigen Vector
GF	1	3	5	1/3	1/2	1/5	1/5	0.7197	0.074	0.5804
KPS	1/3	1	6	1/5	1/2	1/7	1/5	0.4782	0.0492	0.4025
SC	1/5	1/6	1	1/7	1/5	1/7	1/5	0.2228	0.0229	0.1828
PL	3	5	7	1	5	1/3	3	2.4468	0.2517	2.0426
SPFW	2	2	5	1/5	1	1/2	3	1.2917	0.1329	1.0991
SLH	5	7	7	3	2	1	3	3.3161	0.3412	2.6213
GLB	5	5	5	1/3	1/3	1/3	1	1.2447	0.1281	1.1007

λmax =8.0294 **Consistency Index** = 0.1716 **Consistency Ratio** =0.13

Step- 3: Options with respect to SCALE

	GF	KPS	SC	PL	SPFW	SLH	GLB	Eigen Vector	Weight	Comp Eigen Vector
GF	1	1/3	1/3	1/5	1/3	1/5	1/3	0.337	0.0344	0.2732
KPS	3	1	3	1/6	1/5	1/7	1/3	0.545	0.0556	0.4564
SC	3	1/3	1	1/5	1/3	1/7	1/2	0.4659	0.0475	0.3678
PL	5	6	5	1	3	1/2	3	2.5362	0.2588	1.9032
SPFW	3	5	3	1/3	1	1/3	3	1.4724	0.1502	1.1501
SLH	5	7	7	2	3	1	5	3.5672	0.364	2.6737
GLB	3	3	2	1/3	1/3	1/5	1	0.8773	0.0895	0.6637

λmax =7.4881 **Consistency Index** = 0.0814 **Consistency Ratio** =0.0616

Step- 4: Options with respect to ADMIN ACCEPTANCE

	GF	KPS	SC	PL	SPFW	SLH	GLB	Eigen Vector	Weight	Comp Eigen Vector
GF	1	1/7	1/3	1/5	2	1/5	1/3	0.3857	0.042	0.3216
KPS	7	1	3	4	5	3	5	3.4895	0.3796	2.9842

SC	3	1/3	1	1/2	3	1/3	1/4	0.743	0.0808	0.6383
PL	5	1/4	2	1	3	3	3	1.8253	0.1986	1.5619
SPFW	1/2	1/5	1/3	1/3	1	1/2	1/3	0.4071	0.0443	0.3376
SLH	5	1/3	3	1/3	2	1	1/3	1.0152	0.1104	0.8922
GLB	3	1/5	4	1/3	3	3	1	1.3258	0.1442	1.1998

λmax =7.9356 **Consistency Index** = 0.1559 **Consistency Ratio** =0.1181

Step- 5: Options with respect to DATA AVILABILITY

	GF	KPS	SC	PL	SPFW	SLH	GLB	Eigen Vector	Weight	Comp Eigen Vector
GF	1	1/5	1/3	1/3	1/5	1/7	1/3	0.2986	0.0282	0.2201
KPS	5	1	3	3	3	1/5	5	2.0153	0.1905	1.5009
SC	3	1/3	1	1/4	1/3	1/7	1/2	0.4809	0.0455	0.3538
PL	3	1/3	4	1	1/5	1/7	3	0.8582	0.0811	0.6558
SPFW	5	1/3	3	5	1	1/5	5	1.5838	0.1497	1.2368
SLH	7	5	7	7	5	1	7	4.8153	0.4551	3.5889
GLB	3	1/5	2	1/3	1/5	1/7	1	0.5279	0.0499	0.3856

λmax =7.9418 **Consistency Index** = 0.157 **Consistency Ratio** =0.1189

Step- 6: Options with respect to STAKEHOLDER ACCEPTANCE

	GF	KPS	SC	PL	SPFW	SLH	GLB	Eigen Vector	Weight	Comp Eigen Vector
GF	1	5	1/3	1/4	1/5	1/6	1/5	0.4313	0.0464	0.3886
KPS	1/5	1	1/3	1/5	1/5	1/7	1/3	0.2776	0.0299	0.2321
SC	3	3	1	3	1/3	1/5	1/3	0.9296	0.1	0.9397
PL	4	5	1/3	1	2	1/5	3	1.3459	0.1448	1.3176
SPFW	5	5	3	1/2	1	1/3	3	1.6783	0.1806	1.4278
SLH	6	7	5	5	3	1	2	3.4895	0.3755	2.8748
GLB	5	3	3	1/3	1/3	1/2	1	1.1399	0.1227	1.0408

λmax =8.2213 **Consistency Index** = 0.2036 **Consistency Ratio** =0.1542

Step- 7: Options with respect to INSTITUTIONAL AND TECH CAPACITY

	GF	KPS	SC	PL	SPFW	SLH	GLB	Eigen Vector	Weight	Comp Eigen Vector
GF	1	1/3	1/3	1/2	1/2	1/3	2	0.5656	0.0624	0.5175

KPS	**3**	**1**	**5**	**1/5**	**1/5**	**1/7**	**3**	**0.8236**	**0.0909**	**0.8433**
SC	**3**	**1/5**	**1**	**1/3**	**1/5**	**1/7**	**2**	**0.5279**	**0.0583**	**0.5101**
PL	**2**	**5**	**3**	**1**	**1/2**	**1/3**	**3**	**1.4724**	**0.1625**	**1.2899**
SPFW	**2**	**5**	**5**	**2**	**1**	**1/3**	**2**	**1.822**	**0.2011**	**1.6203**
SLH	**3**	**7**	**7**	**3**	**3**	**1**	**4**	**3.4037**	**0.3757**	**2.8945**
GLB	**1/2**	**1/3**	**1/2**	**1/3**	**1/2**	**1/4**	**1**	**0.4453**	**0.0491**	**0.3884**

λmax =8.064 **Consistency Index** = 0.1773 **Consistency Ratio** =0.1343

Final Priority

GROUPER FISHERY	0.0479
PUTTALAM KALPITIYA STRETCH	0.1565
SEA CUCUMBER	0.0783
PUTTALAM LAGOON	0.1751
SMALL PELAGICS FISHERIES WEST COAST	0.137
SPINY LOBSTER HAMBANTOTA	0.2928
GREAT AND LITTLE BASSES	0.1124

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Online application of AHP methodology.Developed by Dr. S.K. Soam, Ch. Sridharababu, T.RajKumar and B.Raghupathi

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Project Prioritization

Pairwise Comparison by Filling Judgement Values

Group Name : GROUP 3

Members : U.L, O.A, R.C, R.A, J.W, M.M,K.B

Goal : PRIORITIZE FMUS FOR IMPEMENTATION IN SRI LANKA

Project Options Table

SNO	Options	Abbreviation/Code
1	GROUPER FISHERY	GF
2	PUTTALAM KALPITIYA STRETCH	KPS
3	SEA CUCUMBER GULF OF MANNAR	SCGM
4	PUTTALAM LAGOON	PL
5	SMALL PELAGIC FISHERIES WEST COAST	SPFW
6	SPINY LOBSTERS HAMBANTOTA	SLH
7	GREAT AND LITTLE BASSES	GLB

Evaluation Criteria Table

SNO	Criteria	Abbreviation/Code
1	ISSUES IN SITE	IIS
2	SCALE	SL
3	ADMIN ACCEPTANCE	AA
4	DATA AVAILABILITY	DA
5	STAKEHOLDERS ACCEPTANCE	SA
6	INSTITUTIONAL AND TECH CAPACITY	ITC

Selection of judgement values by the team on the basis of fundamental scale

Step-1: Criteria with respect to Goal: PRIORITIZE FMUS FOR IMPEMENTATION IN SRI LANKA

	IIS	SL	AA	DA	SA	ITC	Eigen Vector	Weight	Comp Eigen Vector
IIS	1	1/3	1/7	5	1/7	1/7	0.4116	0.0443	0.3203
SL	3	1	1/7	5	1/7	1/7	0.5936	0.0639	0.4515
AA	7	7	1	8	1/2	3	2.8944	0.3116	2.0053
DA	1/5	1/5	1/8	1	1/6	1/4	0.2435	0.0262	0.1941
SA	7	7	2	6	1	3	3.476	0.3742	2.4515
ITC	7	7	1/3	4	1/3	1	1.6711	0.1799	1.2706

λmax = 6.6933 **Consistency Index** = 0.1387 **Consistency Ratio** =0.1118

Step- 2: Options with respect to ISSUES IN SITE

	GF	KPS	SCGM	PL	SPFW	SLH	GLB	Eigen Vector	Weight	Comp Eigen Vector
GF	1	1/5	1/5	1/9	1/9	1/3	5	0.3625	0.0315	0.2891
KPS	5	1	9	1/7	1/7	1/3	9	1.1558	0.1005	0.9707
SCGM	5	1/9	1	1/5	1/9	1/7	5	0.5087	0.0442	0.4097
PL	9	7	5	1	1/3	1/7	5	1.853	0.1611	1.6233
SPFW	9	7	9	3	1	3	9	4.6346	0.4029	3.1526
SLH	3	3	7	7	1/3	1	9	2.7921	0.2427	2.3634
GLB	1/5	1/9	1/5	1/5	1/9	1/9	1	0.1957	0.017	0.1473

λmax =8.9561 **Consistency Index** = 0.326 **Consistency Ratio** =0.247

Step- 3: Options with respect to SCALE

	GF	KPS	SCGM	PL	SPFW	SLH	GLB	Eigen Vector	Weight	Comp Eigen Vector
GF	1	1/5	1/5	1/9	1/9	1/7	5	0.3212	0.0274	0.2351
KPS	5	1	7	1/7	1/7	1/5	7	1	0.0852	0.7961
SCGM	5	1/7	1	1/7	1/7	1/7	7	0.5466	0.0466	0.4234
PL	9	7	7	1	1/3	1/3	7	2.3024	0.1963	1.685
SPFW	9	7	7	3	1	1/3	9	3.2666	0.2784	2.2945
SLH	7	5	7	3	3	1	9	4.111	0.3504	2.8597

GLB	1/5	1/7	1/7	1/7	1/9	1/9	1	0.1842	0.0157	0.1379

λmax =8.4317 Consistency Index = 0.2386 Consistency Ratio =0.1808

Step- 4: Options with respect to ADMIN ACCEPTANCE

	GF	KPS	SCGM	PL	SPFW	SLH	GLB	Eigen Vector	Weight	Comp Eigen Vector
GF	1	1/7	1/7	1/9	1/9	1/9	5	0.2815	0.0224	0.2097
KPS	7	1	1/5	1/7	1/7	1/9	5	0.5533	0.044	0.4037
SCGM	7	5	1	1/9	1/7	1/9	7	0.887	0.0705	0.6613
PL	9	7	9	1	1/7	1/3	7	2.1145	0.168	1.5691
SPFW	9	7	7	7	1	3	9	5.0464	0.401	3.5542
SLH	9	9	9	3	1/3	1	9	3.5098	0.2789	2.286
GLB	1/5	1/5	1/7	1/7	1/9	1/9	1	0.1933	0.0154	0.1382

λmax =8.8221 Consistency Index = 0.3037 Consistency Ratio =0.2301

Step- 5: Options with respect to DATA AVAILABILITY

	GF	KPS	SCGM	PL	SPFW	SLH	GLB	Eigen Vector	Weight	Comp Eigen Vector
GF	1	3	1/7	1/7	1/5	1/9	3	0.4557	0.0378	0.3072
KPS	1/3	1	1/3	1/7	1/7	1/9	3	0.3581	0.0297	0.2436
SCGM	7	3	1	1/3	7	1/7	9	1.8074	0.15	1.713
PL	7	7	3	1	1/5	1/9	5	1.4904	0.1237	1.2265
SPFW	5	7	1/7	5	1	1/7	7	1.5838	0.1314	1.3773
SLH	9	9	7	9	7	1	9	6.1198	0.5079	4.3742
GLB	1/3	1/3	1/9	1/5	1/7	1/9	1	0.2347	0.0195	0.1586

λmax =9.4005 Consistency Index = 0.4001 Consistency Ratio =0.3031

Step- 6: Options with respect to STAKEHOLDERS ACCEPTANCE

	GF	KPS	SCGM	PL	SPFW	SLH	GLB	Eigen Vector	Weight	Comp Eigen Vector
GF	1	1/5	1/3	1/7	1/7	1/9	3	0.3329	0.0306	0.2488
KPS	5	1	7	1/9	5	9	5	2.632	0.2423	4.1288

SCGM	3	1/7	1	1/5	3	1/9	5	0.7573	0.0697	0.5738
PL	7	9	5	1	9	1/9	5	2.8626	0.2635	3.6938
SPFW	7	1/5	1/3	1/9	1	1/7	7	0.6552	0.0603	0.5732
SLH	9	1/9	9	9	7	1	9	3.386	0.3117	4.2322
GLB	1/3	1/5	1/5	1/5	1/7	1/9	1	0.2373	0.0218	0.1904

λmax =13.641 **Consistency Index** = 1.1068 **Consistency Ratio** =0.8385

Step- 7: Options with respect to INSTITUTIONAL AND TECH CAPACITY

	GF	KPS	SCGM	PL	SPFW	SLH	GLB	Eigen Vector	Weight	Comp Eigen Vector
GF	1	1/5	1/3	1/7	1/5	1/9	5	0.3758	0.0298	0.2522
KPS	5	1	7	1/3	1/7	1/9	5	0.9891	0.0783	0.7337
SCGM	3	1/7	1	1/5	1/5	1/9	5	0.5143	0.0407	0.345
PL	7	3	5	1	5	1/9	7	2.3605	0.1869	1.643
SPFW	5	7	5	1/5	1	1/9	7	1.6032	0.127	1.2394
SLH	9	9	9	9	9	1	9	6.5754	0.5207	4.8346
GLB	1/5	1/5	1/5	1/7	1/7	1/9	1	0.2102	0.0166	0.1491

λmax =9.197 **Consistency Index** = 0.3662 **Consistency Ratio** =0.2774

Final Priority

GROUPER FISHERY	0.0279
PUTTALAM KALPITIYA STRETCH	0.1291
SEA CUCUMBER GULF OF MANNAR	0.0642
PUTTALAM LAGOON	0.2075
SMALL PELAGIC FISHERIES WEST COAST	0.2094
SPINY LOBSTERS HAMBANTOTA	0.3436
GREAT AND LITTLE BASSES	0.0182

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Project Prioritization

Pairwise Comparison by Filling Judgement Values

Group Name : 4

Members : JAYASIRI

Goal : FOR PRIORITIZE FMUS FOR IMPLEMENTATION OF EAFM IN SRI LANKA

Project Options Table

SNO	Options	Abbreviation/Code
1	GROUPER FISHER	GF
2	PUTTALAM KALPITIYA STRETCH	KPS
3	SEA CUCUMBER GULF OF MANNAR	SCGM
4	PUTTALAM LAGOON	PL
5	SMALL PELAGICS FISHERIES WEST COAST	SPFW
6	SPINY LOBSTER HAMBANTOTA	SLH
7	GREAT AND LITTLE BASSES	GLB

Evaluation Criteria Table

SNO	Criteria	Abbreviation/Code
1	ISSUES IN SITE	IIS
2	SCALE	SL
3	ADMIN ACCEPTANCE	AA
4	DATA AVAILABILITY	DA
5	STAKEHOLDERS ACCEPTANCE	SA
6	INSTITUTIONAL TECH CAPACITY	ITC

Selection of judgement values by the team on the basis of fundamental scale

Step-1: Criteria with respect to Goal: FOR PRIORITIZE FMUS FOR IMPLEMENTATION OF EAFM IN SRI LANKA

	IIS	SL	AA	DA	SA	ITC	Eigen Vector	Weight	Comp Eigen Vector
IIS	1	1/3	1/7	5	1/7	1/7	0.4116	0.0443	0.3203
SL	3	1	1/7	5	1/7	1/7	0.5936	0.0639	0.4515

AA	7	7	1	8	1/2	3	2.8944	0.3116	2.0053
DA	1/5	1/5	1/8	1	1/6	1/4	0.2435	0.0262	0.1941
SA	7	7	2	6	1	3	3.476	0.3742	2.4515
ITC	7	7	1/3	4	1/3	1	1.6711	0.1799	1.2706

λmax = 6.6933 **Consistency Index** = 0.1387 **Consistency Ratio** =0.1118

Step- 2: Options with respect to ISSUES IN SITE

	GF	KPS	SCGM	PL	SPFW	SLH	GLB	Eigen Vector	Weight	Comp Eigen Vector
GF	1	1/5	1/3	1/7	1/5	5	9	0.704	0.0659	0.5723
KPS	5	1	5	6	1/5	3	9	2.6031	0.2435	3.1334
SCGM	3	1/5	1	1/7	1/5	5	9	0.9636	0.0901	0.7641
PL	7	1/6	7	1	7	7	9	3.2216	0.3014	3.556
SPFW	5	5	5	1/7	1	5	9	2.6002	0.2433	2.62
SLH	1/5	1/3	1/5	1/7	1/5	1	9	0.4445	0.0416	0.3737
GLB	1/9	1/9	1/9	1/9	1/9	1/9	1	0.1521	0.0142	0.1238

λmax =11.1433 **Consistency Index** = 0.6905 **Consistency Ratio** =0.5231

Step- 3: Options with respect to SCALE

	GF	KPS	SCGM	PL	SPFW	SLH	GLB	Eigen Vector	Weight	Comp Eigen Vector
GF	1	1/5	1/7	1/7	1/3	5	9	0.671	0.0561	0.509
KPS	5	1	5	1/7	5	5	9	2.6002	0.2172	1.952
SCGM	7	1/5	1	1/7	1/7	5	9	1.0366	0.0866	0.8941
PL	7	7	7	1	7	7	9	5.4949	0.4591	4.2709
SPFW	3	1/5	7	1/7	1	5	9	1.6013	0.1338	1.3042
SLH	1/5	1/5	1/5	1/7	1/5	1	9	0.4132	0.0345	0.3132
GLB	1/9	1/9	1/9	1/9	1/9	1/9	1	0.1521	0.0127	0.1224

λmax =9.3658 **Consistency Index** = 0.3943 **Consistency Ratio** =0.2987

Step- 4: Options with respect to ADMIN ACCEPTANCE

	GF	KPS	SCGM	PL	SPFW	SLH	GLB	Eigen Vector	Weight	Comp Eigen Vector
GF	1	3	1/5	1/7	1/7	1/3	9	0.6238	0.0555	0.7752
KPS	1/3	1	5	1/7	5	5	9	1.766	0.1572	1.9012

SCGM	5	1/5	1	1/7	1/5	5	9	1.0366	0.0923	0.8929
PL	7	7	7	1	5	7	9	5.237	0.4663	3.9075
SPFW	7	1/5	5	1/5	1	5	9	1.8074	0.1609	1.5286
SLH	3	1/5	1/5	1/7	1/5	1	9	0.6084	0.0542	0.4914
GLB	1/9	1/9	1/9	1/9	1/9	1/9	1	0.1521	0.0135	0.1231

λmax =9.6199 **Consistency Index** = 0.4367 **Consistency Ratio** =0.3308

Step- 5: Options with respect to DATA AVAILABILITY

	GF	KPS	SCGM	PL	SPFW	SLH	GLB	Eigen Vector	Weight	Comp Eigen Vector
GF	1	1/7	5	1/7	1/7	1/5	9	0.5945	0.0508	0.6865
KPS	7	1	7	1/7	3	5	9	2.6611	0.2275	1.9183
SCGM	1/5	1/7	1	1/7	5	3	9	0.9184	0.0785	0.9861
PL	7	7	7	1	7	7	9	5.4949	0.4699	4.2069
SPFW	7	1/3	1/5	1/7	1	5	9	1.1699	0.1	1.0326
SLH	5	1/5	1/3	1/7	1/5	1	9	0.704	0.0602	0.5902
GLB	1/9	1/9	1/9	1/9	1/9	1/9	1	0.1521	0.013	0.1227

λmax =9.5433 **Consistency Index** = 0.4239 **Consistency Ratio** =0.3211

Step- 6: Options with respect to STAKEHOLDERS ACCEPTANCE

	GF	KPS	SCGM	PL	SPFW	SLH	GLB	Eigen Vector	Weight	Comp Eigen Vector
GF	1	3	1/5	1/7	1/5	1/5	9	0.6084	0.0591	1.1586
KPS	1/3	1	5	5	5	5	9	2.9348	0.2852	3.6422
SCGM	5	1/5	1	1/7	1/7	1/3	9	0.671	0.0652	0.651
PL	7	1/5	7	1	5	7	9	3.1514	0.3063	2.9008
SPFW	5	1/5	7	1/5	1	5	9	1.8074	0.1757	1.6475
SLH	5	1/5	3	1/7	1/5	1	9	0.9636	0.0937	0.8539
GLB	1/9	1/9	1/9	1/9	1/9	1/9	1	0.1521	0.0148	0.1243

λmax =10.9782 **Consistency Index** = 0.663 **Consistency Ratio** =0.5023

Step- 7: Options with respect to INSTITUTIONAL TECH CAPACITY

	GF	KPS	SCGM	PL	SPFW	SLH	GLB	Eigen Vector	Weight	Comp Eigen Vector
GF	1	1/5	3	1/7	1/5	1/5	9	0.6084	0.0513	0.4338

KPS	**5**	**1**	**5**	**1/5**	**5**	**5**	**9**	**2.7282**	**0.2303**	**2.0087**
SCGM	**1/3**	**1/5**	**1**	**1/7**	**1/5**	**1/5**	**9**	**0.4445**	**0.0375**	**0.3246**
PL	**7**	**5**	**7**	**1**	**7**	**7**	**9**	**5.237**	**0.442**	**3.9132**
SPFW	**5**	**1/5**	**5**	**1/7**	**1**	**5**	**9**	**1.6417**	**0.1386**	**1.245**
SLH	**5**	**1/5**	**5**	**1/7**	**1/5**	**1**	**9**	**1.0366**	**0.0875**	**0.7842**
GLB	**1/9**	**1/9**	**1/9**	**1/9**	**1/9**	**1/9**	**1**	**0.1521**	**0.0128**	**0.1225**

λmax =8.832 **Consistency Index** = 0.3053 **Consistency Ratio** =0.2313

Final Priority

GROUPER FISHER	0.0565
PUTTALAM KALPITIYA STRETCH	0.2278
SEA CUCUMBER GULF OF MANNAR	0.0715
PUTTALAM LAGOON	0.3944
SMALL PELAGICS FISHERIES WEST COAST	0.1627
SPINY LOBSTER HAMBANTOTA	0.0733
GREAT AND LITTLE BASSES	0.0138

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Online application of AHP methodology.Developed by Dr. S.K. Soam, Ch. Sridharababu, T.RajKumar and B.Raghupathi

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The Bay of Bengal Programme Inter-Governmental Organisation (BOBP-IGO), set up in 2003, is a regional fisheries advisoy body (RFAB) with Bangladesh, India, Maldives and Sri Lanka as its member countries. The Organisation evolved from the erstwhile Bay of Bengal Programme of the Food and Agriculture Organization of the United Nations (FAO) founded in 1979.

The BOBP-IGO is mandated to enhance cooperation among its member-countries as well as other countries and organizations in the Bay of Bengal region and provide technical and management advisory for sustainable fisheries development and management.

BOBP-IGO is committed to contributing towards accelerating the transformation of the fisheries sector of this egion towards real-time, evidence-driven, and ecosystem-based management, leveraging our global knowledge networks and effective partnership with the national governments and their constituent research and academic institutions.

For further details, please see: www.bobpigo.org

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