



Food and Agriculture  
Organization of the  
United Nations

**ECOSYSTEM APPROACH TO FISHERIES MANAGEMENT  
TRAINING COURSE (INLAND FISHERIES)  
VOLUME 1: HANDBOOK FOR TRAINEES**



Cover image: Emmanuela D'Antoni, "Inland Fisheries" (FAO, 2003).

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FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS  
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## PREPARATION OF THIS DOCUMENT

This Essential-Ecosystem Approach to Fisheries management (EAFm) inland fisheries training course is a development of the Essential-Ecosystem Approach to Fisheries Management (E-EAFm) training course, which was developed over several years starting in 2012. The consortium of institutions and projects which developed the course consisted of: the Food and Agriculture Organization (FAO) of the United Nations, the National Oceanic and Atmospheric Administration (NOAA) and IMA International.

The Essential-Ecosystem Approach to Fisheries management (E-EAFm) training course and E-EAFm Training of Trainers Course are rooted in, and closely follow the EAF Guidelines and Tools produced by FAO from 2003 onwards, through the EAF-Nansen Project (and tested and applied mainly in Africa and the Caribbean). In mid-2012, IMA International was invited to explore and coordinate the potential and opportunity for harmonizing or merging regional EAFm capacity development processes.

A first EAFm curriculum development ‘writeshop’ was held in November 2012 in Phuket, Thailand. This was followed by a second ‘writeshop’ in Manila, Philippines, in January 2013. A training package was produced and used as course material for a first “Essential EAFm” pilot-training and training-of-trainers in Kota Kinabalu, Malaysia, in June 2013. Based on the experience gained from this pilot training, the course material was further improved and finalized.

The drafting team for the original E-EAFm training handbook included Rusty Brainard (NOAA), Silvia Capezzuoli (IMA International), Simon Funge-Smith (FAO), Chris Grose (IMA International), Adel Heenan (NOAA), Rudolf Hermes (BOBLME), Paulo Maurin (NOAA), Megan Moews (NOAA), Chris O’Brien (BOBLME), Robert Pomeroy (USAID-CTSP) and Derek Staples (Fisheries Management Consultant). Nygiel Armada, Robert Pomeroy and Derek Staples drafted the original written modules for this course. Additional input was provided by Janna Shackeroff, Robert Schroeder, Jarad Makaiau and Max Sudnovsky (all NOAA) and Magnus Torell (SEAFDEC). Figures used and adapted with permission from the United Nations Environment Programme (UNEP) and the International Collective in Support of Fishworkers (ICSF).

The original coastal/marine-focussed E-EAFm has been modified for application in a number of countries and regions by FAO, SEAFDEC, The Nature Conservancy and USAID funded projects.

The modification for application of the E-EAFm handbook and training materials to inland fisheries contexts, was undertaken by Simon Funge-Smith (FAO), Rick Gregory (FAO), John Jorgensen (FAO) and Silvia Capezzuoli (IMA International) during 2018-19.

The EAFm Inland fisheries training course was piloted in Mangochi, Malawi in March 2019, supported by the FAO/GEF project “*Building climate change resilience in the fisheries sector in Malawi*”. The training material was finalized in May 2019.

## **ABSTRACT**

This Ecosystem Approach to Fisheries management training course (Inland Fisheries) is designed as a complete training course for the sustainable management of inland fisheries using the ecosystem approach. It is targeted at middle-level fishery and environment officers, extension workers, facilitators and other stakeholders engaged in the planning and management of inland fisheries.

This training course is designed to be applicable to many inland fishery contexts around the world (including overlapping freshwater fishery/aquaculture systems). It is also intended to be adapted to suit specific local contexts.

This is the first of three volumes, developed for the training course:

**VOLUME 1: HANDBOOK FOR TRAINEES**

**VOLUME 2: INLAND FISHERY CASE STUDIES**

**VOLUME 3: TRAINING COURSE PRESENTATIONS & VISUALS**

**VOLUME 4: TRAINING SESSION PLANS**

This volume is **VOLUME 1: HANDBOOK FOR TRAINEES** and contains the background reading material required for each of the training course modules.

## CONTENTS

Preparation of this document.....	iii
Abstract .....	iv
Contents.....	v
Acronyms .....	vi
About this training course .....	1
Ecosystem Approach to Fisheries (EAF) or Ecosystem Approach to Fisheries management (EAFm)?.....	2
Adjusting training to different audiences.....	3
What does the essential EAFm training provide?.....	5
Essential EAFm (inland) course timetable.....	7
Essential EAFm course objectives - day by day .....	8
Terms used in the EAFm training.....	12
Module 1: Threats and issues in inland fisheries.....	19
Module 2: Fisheries management and the ecosystem approach.....	31
Module 3: The what and why of EAFm?.....	41
Module 4: Principles of EAFm .....	51
Module 5: Moving towards EAFm .....	65
Module 6: EAFm plans – the link between policy and action.....	69
Module 7: EAFm process overview.....	75
Module 8: Startup A – Preparing for EAFm .....	83
Module 9: Startup B - Stakeholder engagement.....	93
Module 10: Steps 1.1, 1.2 & 1.3 Define and scope the Fisheries Management Unit.....	105
Module 11: Steps 2.1, 2.2 & 2.3 Identify and prioritize issues and goals .....	115
Module 12: Reality check I.....	129
Module 13: Steps 3.1 & 3.2 Develop objectives, targets and indicators .....	139
Module 14: Steps 3.3, 3.4 & 3.5 Management actions, compliance, finance and finalize EAFm plan .....	147
Module 15: Step 4.1 Formalize, communicate and engage .....	159
Module 16: Reality check II.....	165
Module 17: Step 5.1 & 5.2 Monitor, evaluate and adapt the plan.....	185
References and further reading.....	193



## ACRONYMS

APFIC	Asia Pacific Fishery Commission
BOBLME	Bay of Bengal Large Marine Ecosystem Project
CCA	Climate Change Adaptation
CCRF	Code of Conduct for Responsible Fisheries
CTSP	Coral Triangle Support Partnership
EA	Ecosystem Approach
EAF	Ecosystem Approach to Fisheries
EAFm	Ecosystem Approach to Fisheries Management
EAFm LEAD	EAFm Leaders, Executives and Decision Makers (training course)
EBFM	Ecosystem Based Fisheries Management
FAO	Food and Agriculture Organization of the United Nations
FMP	Fisheries Management Plan
FMU	Fisheries Management Unit
FCZ	Freshwater Conservation Zone
IPCC	Intergovernmental Panel on Climate Change
ITQ	Individual Transferable Quota
IUU	Illegal Unregulated and Unreported
IWM	Integrated Watershed Management
IWRM	Integrated Water Resources Management
MCS	Monitoring, Control and Surveillance
MOU	Memorandum of Understanding
NMUV	Non-market use value
NOAA	National Oceanic and Atmospheric Administration, USA
RFMO	Regional Fisheries Management Organization
SEAFDEC	Southeast Asian Fisheries Development Centre
TAC	Total Allowable Catch
TURF	Territorial Use Rights in Fisheries
USAID	US Agency for International Development



## **ABOUT THIS TRAINING COURSE**

The *Essential Ecosystem Approach to Fisheries Management* (EAFm) course materials, Training of Trainers and EAFm *Leaders, Executives and Decision-makers* training (LEAD) materials are available for use, free of charge. The EAFm course materials are intended for adaptation or translation to reflect the local context and characteristics of a fishery or the issues that affect it. This will increase participants' understanding of the relevance and application of the EAFm approach in their contexts. In many cases, translation into national language may also be an important step to increase understanding of trainers and trainees.

## ECOSYSTEM APPROACH TO FISHERIES (EAF) OR ECOSYSTEM APPROACH TO FISHERIES MANAGEMENT (EAFm)?

EAF is the ecosystem approach applied to fisheries. The term was formally adopted at the 2001 FAO Reykjavik Conference and was not limited to management, but was intended to cover development, planning, food safety, and governance to better match the breadth of the FAO Code of Conduct for Responsible Fisheries.

EAFm is a subset of EAF, and is the ecosystem approach applied to fisheries management. This Handbook focuses on inland fisheries management and uses the term EAFm throughout. A similar, and widely used term is EBFM – ecosystem-based fisheries management. The term did not meet with consensus at the 2001 FAO Reykjavik Conference, possibly because some countries took it as implying that the "ecosystem" would become the new "foundation" of fisheries management. This may have been interpreted as giving environmental considerations pre-eminence over socio-economic and cultural ones, raising concern about equity, political as well as socio-economic costs and feasibility.

The ecosystem approach to fisheries management (EAFm) and its module-based training package, the Essential Ecosystem Approach to Fisheries Management (E-EAFm) offer a practical and effective approach to managing fisheries in such a holistic manner (Staples *et al.*, 2014). EAFm represents a move away from fisheries management that focuses on single target species, towards a systems-based decision-making process that aims to balance environmental, human and social well-being through improved governance frameworks (Staples *et al.*, 2014).

The original E-EAFm focused on the management of coastal and inshore fisheries, and over the past decade has become popular in many countries, including Indonesia, Philippines and Thailand, as a capacity building tool. To date, EAFm has been applied mainly to coastal fisheries management, but its ecosystem-based, stakeholder-led approach also makes it a suitable tool for developing plans for inland fisheries management. Although the E-EAFm training has been tried out in a few inland fisheries situations, (most notably in Lao PDR by SEAFDEC in 2015), the Malawi E-EAFm course of March 2019, is the first E-EAFm training course that has been fully revised for application in inland fisheries. A complementary framework for EAFm in freshwater irrigation systems has also been developed (Gregory *et al.* 2018).

## ADJUSTING TRAINING TO DIFFERENT AUDIENCES

Different audiences require different approaches to capacity development and also different materials. The main target for this Essential EAFm is mid-level managers and fishery and environment staff, as well as related economic development and planning staff, at provincial/state and district/local levels, who are responsible for administering or managing inland water and brackish water fisheries and the aquatic environments.

Essential EAFm is designed to enable local adaptation for different countries – there is no need for re-designing the course material for such a broad target group. However, it is suggested that local, context-specific (for the country of training) case studies, possibly sourced from the course participants, are included and that there is some level of awareness of a particular country or sub-region’s fisheries and environmental laws and regulations.

A major strength of this course is that it allows participants to develop and take away a draft EAFm plan. This can be further developed and implemented in the participant’s country or as a transboundary plan.

The closely related EAFm for leaders, executives, and decision makers (LEAD) Toolkit, aims to provide senior-level leaders with an understanding and forum for discussion of the why, what and how to implement EAFm from national to local levels. A concise overview PowerPoint presentation on the EAFm, supported by a one-pager providing information on “Essential EAFm in a nutshell” and its course content and objectives could also be used to address top level decision-makers (also available as a companion to Essential EAFm).

Globally, the decentralisation of fisheries management planning to local authorities and the increased participation of communities in fisheries co-management and community-based approaches are gathering pace and the E-EAFm is highly complementary in that it provides tools for capacity building for local and community fisheries planning.

Some materials for capacity development on community-based ecosystem approach to inland fisheries management have been developed by NGOs and INGOs Examples include:

**Guidelines for Fisheries Co-management** (*DLF and WWF. 2009. Fisheries co-management guidelines. WWF, Vientiane. 20 pp.*): These guidelines were developed to support the establishment and recognition of community fishery management plans. These were piloted and implemented in the three central provinces of Lao PDR (Bolikhamxay, Khammouane and Savannakhet).

**Guidelines for rice field fisheries system management** (*Kim et al, 2019, in preparation*): These guidelines were developed to guide relevant stakeholders and target communities in how to approach i) the selection of Community Fish Refuges (CFR) and ii) the process of designing and implementing improvements to the them.

**Freshwater Fisheries Governance Reforms in Myanmar - Case study from Ayeyarwaddy Region** (*Nyein et al. 2019, Journal of Burma studies, in press*). Between 2012 and 2018 fisheries legislation and policies in Myanmar’s coastal states and regions changed to support of community co-management of fisheries and the strengthening of small-scale fisher rights. Several NGOs, (NAG and Pyoe Pin) and a number of international organizations (including FAO) had promoted and piloted community fisheries co-

management approaches and lobbied relentlessly for the improved rights of small-scale fishers. The formation of fisher networks and fisheries partnerships facilitating inter and cross state/regional communications and collaboration, proved to be an effective change mechanism.

## WHAT DOES THE ESSENTIAL EAFm TRAINING PROVIDE?

The Essential EAFm course provides trainees with the skills that will help them to develop an EAFm plan to manage inland capture fisheries in a more sustainable and equitable manner. This course will equip trainees to:

- manage fisheries holistically (taking into account environmental, social and economic needs, as well as addressing the governance context)
- be more confident in resolving fisheries issues and challenges;
- liaise with user groups to understand and reduce conflicts;
- develop understanding of external threats.
- work cooperatively with other stakeholders; and
- help unlock financial resources and increase political will to support management plans

Participants will learn about EAFm concepts and work with an EAFm plan template to develop a draft EAFm plan for their area. They will understand the principles of EAFm and co-management and how to foster cross-sector coordination and will also practice the crucial skills of effective communication, facilitation, and conflict management.

### OVERALL COURSE OBJECTIVES

Participants will understand the concept and need for an Ecosystem Approach to Fisheries Management (EAFm), and learn skills and knowledge to develop, implement and monitor an “EAFm plan” to more sustainably manage inland capture fisheries.

### AUDIENCE

This Essential EAFm course targets mid-level managers and fishery and environment staff, as well as related economic development and planning staff, at provincial/state and district/local levels who are responsible for administering or managing inland fisheries and the freshwater environments.

### SCOPE AND CONTEXT

This course is designed to be applicable to many inland fishery contexts (including overlapping freshwater fishery/aquaculture systems). The original version of the course was directed towards coastal marine fisheries. This handbook and Powerpoint presentations therefore focus specifically on “inland fisheries” that take place in freshwater/brackish aquatic environments. By changing the focus and examples, the course can be applied to inland fisheries in many different regions of the world, as the principles and the approach to management are the same.

### COURSE STRUCTURE

Initially the course explains what exactly EAFm is and why EAFm is the preferred approach for the sustainable management of fisheries. It then explains how EAFm can work: by developing an EAFm plan, followed by implementing, monitoring, evaluating and adapting the plan.

## **TRAINING METHODOLOGY**

The course is highly participatory. To complement input from the trainers, participants work in pairs, in groups and individually on specifically designed exercises. The exercises are designed to consolidate learning. The trainers should try, as far as possible, to work with real, local examples and thereby expect active participation from trainees.

## **LEARNING AND FEEDBACK**

Daily monitoring and reviews ensure that feedback from participants is integrated into course design where possible. Pre- and post-course assessment, as well as a quiz, enable the trainers to assess progress.

## **COURSE MATERIALS**

Each step of the EAFm process is explained in dedicated modules in this course Handbook and the accompanying PowerPoint presentations. The Workbook may be used to write notes for each stage. The linked Toolkit provides the “People” and “Technical” tools which can be used at different stages in the EAFm process. A separate annex provides a selection of Inland Fisheries case studies. After successfully completing the course, participants should receive an electronic version of the Handbook, PowerPoint presentations and the Toolkit, together with any additional resources.

## **TRAINERS**

The trainees should be trained by internationally experienced participatory facilitators. They must be supported by personnel with extensive regional fisheries management knowledge and experience.

## ESSENTIAL EAFm (INLAND) COURSE TIMETABLE

	DAY 1 What & why	DAY 2 How	DAY 3 Plan & check	DAY 4 Do & check	DAY 5 Present
08.30 – 10.10	Registration Introductions <b>Course overview</b> 1) Threats and issues in fisheries	5) Moving towards EAFm EAFm case study	<b>10) Step 1: Define &amp; scope the Fishery Management Unit (FMU)</b> 1.1 Define the FMU 1.2 Agree on the vision 1.3 Scope the FMU	<b>13) Step 3: Develop the EAFm plan</b> 3.1 Develop management objectives 3.2 Develop indicators, targets and baseline	Quiz review <b>Participant work:</b> refining EAFm plans & preparing presentations
Break					
10.30 – 12.30	2) Fisheries management and the ecosystem approach 3) The what and why of EAFm?	6) EAFm plans: the link between policy and action 7) EAFm process overview 8) Startup A Preparing the ground	<b>11) Step 2: Identify &amp; prioritize issues &amp; goals</b> 2.1 Identify FMU-specific issues 2.2 Prioritize issues 2.3 Define goals <b>12) Reality check I</b> Constraints and opportunities	<b>14) Step 3: Develop the EAFm plan ...cont'd</b> 3.3 Agree management actions 3.4 Include financing mechanisms 3.5 Finalize EAFm plan <b>15) Step 4: Implement the plan</b> 4.1 Formalize, communicate and engage	<b>Participant presentations</b> on EAFm key elements to illustrate learning  Feedback on presentations
Lunch					
13.30 – 14.45	4) Principles of EAFm	8) Startup A Preparing the ground ...cont.	<b>12) Reality check I...cont'd</b> Facilitation skills	<b>16) Reality check II</b> Align to EAFm principles Supporting environment	Course review Individual action planning
Break					
15.05 – 16.30	4a) How much EAFm are you already doing?	9) Startup B Engaging stakeholders	<b>12) Reality check I...cont'd</b> Conflict management	<b>17) Step 5: Monitor, evaluate and adapt</b> 5.1 Monitor and evaluate performance 5.2 Review and adapt the plan <b>EAFm QUIZ</b>	Course evaluation Course closure and certification
17.00 wrap up	<b>Homework:</b> EAFm progress			<b>Homework:</b> Presentation preparation	



## ESSENTIAL EAFm COURSE OBJECTIVES - DAY BY DAY

### Overall course objective:

You will understand the concept and the need for an Ecosystem Approach to Fisheries Management (EAFm) and learn skills and knowledge to develop, implement and monitor an EAFm plan to more sustainably manage inland capture fisheries.

This is a five-day course:

**Day 1:** To understand what EAFm is and why we should use it.

**Day 2:** To understand what moving towards EAFm entails.

**Day 3:** To work through the EAFm planning process.

**Day 4:** To work through implementing EAFm plans.

**Day 5:** To present and receive feedback on group EAFm plans

### Day 1 - WHY AND WHAT

#### Participant introductions and course overview

*At the end of the session you will have:*

- Introduced yourselves and communicated your personal hopes and concerns for the course;
- Stated aims and objectives of the course; and
- Identified threats and issues faced by your fisheries and associated ecosystems.

#### Fisheries management and the ecosystem approach

*At the end of the session you will be able to:*

- Realize a new management approach is required to address the many threats and issues facing capture fisheries;
- Recognize how ecosystems benefit human societies;
- Describe the concept of the ecosystem approach (EA); and
- Explain some of the benefits of using an EA.

#### The what and why EAFm?

*At the end of the session you will be able to:*

- Describe what EAFm is;
- Describe the benefits of using an EAFm;
- Explain how EAFm complements other approaches; and
- Recognize the complexities of multiple societal objectives.

#### Principles of EAFm

*At the end of the session you will be able to:*

- Examine the principles of an EAFm and their link to the FAO Code of Conduct for Responsible Fisheries (CCRF).

**What is EAFm and how much are you already doing?**

*At the end of the session you will be able to:*

- Revisit your threats and issues and cluster them according to the three EAFm components;
- Realize that you are already doing some aspects of an EAFm;
- Analyze your current fisheries practices and identify what EAFm you are already doing; and
- Identify gaps in your EAFm practices and possible ways to move forward.

**Day 2 – HOW****Moving towards EAFm**

*At the end of the session you will be able to:*

- Recognize how other countries are moving towards EAFm principles (case study - linking fisheries, environment and socio-economic considerations)
- Determine your country progress towards EAFm
- Identify your country challenges to achieving this

**EAFm plans: the link between policy and actions**

*At the end of the session you will be able to:*

- Recognize the need for effective planning and plans to translate policies into actions.

**EAFm process overview**

*At the end of the session you will be able to:*

- Describe the key steps of the EAFm process and how to plan, implement and monitor EAFm;
- Identify the planning steps in the EAFm process; and
- Describe the outline of an EAFm plan.

**Startup****A. Preparing the ground**

*At the end of the session you will be able to:*

- Define startup tasks needed to initiate the EAFm process; and
- Learn how to identify and prioritise stakeholders.

**Startup****B. Stakeholder engagement**

*At the end of the session you will be able to:*

- Apply participatory approaches to stakeholder engagement;
- Organize and hold stakeholder meetings; and
- Describe the basic concepts of co-management.

## Day 3 – PLAN AND CHECK

### Step 1: Define and scope the Fisheries Management Unit (FMU)

*At the end of the session you will be able to:*

- Describe FMU defining and scoping; and
- Undertake visioning and be able to agree on a vision.

### Step 2: Identify and prioritize issues and goals

#### Steps 2.1 to 2.3

*At the end of the session you will be able to:*

- Identify your FMU-specific issues;
- Prioritize issues through risk assessment; and
- Develop goals for your EAFm plan.

#### Reality Check I

*At the end of the session you will be able to:*

- Identify constraints and opportunities related to your FMU goals;
- Use facilitation skills with co-management partners in focus group discussions (FGDs); and
- Use conflict management tools and practise a range of techniques.

### Step 3a: Develop objectives, indicators, targets and the baseline

#### Steps 3.1 & 3.2

*At the end of the session you will be able to:*

- Develop management objectives; and
- Develop indicators and targets related to these objectives.

### Step 3b: Management actions, compliance, finance & finalize EAFm plan

#### Steps 3.3 to 3.5

*At the end of the session you will be able to:*

- Identify management actions and how stakeholders will participate/comply with these;
- Explore financing mechanisms for the plan; and
- Bring it all together – finalize the EAFm plan.

## Day 4 – DO AND CHECK

### Step 4: Implement the plan

#### Step 4.1 Formalize, communicate and engage

*At the end of the session you will be able to:*

- Develop an implementation work plan;
- Summarize what is meant by formal adoption of the EAFm plan; and
- Develop a communication strategy.

**Reality Check II**

*At the end of the session you will be able to:*

- Check on the status of the EAFm plan implementation;
- Consider whether implementation is in line with the principles of EAFm;
- Check on the practicalities – is the supporting environment in place?; and
- Revisit the constraints and opportunities in meeting your FMU goals.

**Step 5: Monitor, evaluate and adapt****Steps 5.1 & 5.2**

*At the end of the session you will be able to:*

- Plan what has to be monitored, why, when, how and by whom;
- Monitor how well management actions are meeting goals and objectives;
- Evaluate monitoring information and report on performance; and
- Review and adapt the plan.

**Day 5 – PRESENT AND SHOW LEARNING****Participant group work preparing presentations**

*At the end of the session you will have:*

- Prepared your FMU group EAFm plans presentations.

**Participant presentations**

*At the end of the session you will have:*

- Presented your FMU group EAFm plans or tools related to the plan to the wider group;
- Received feedback on your presentation; and
- Given constructive feedback on others' presentations.

**Course review and individual action planning**

*At the end of the session you will have:*

- Discussed key learning from the course; and
- Developed an individual action plan and potential next steps for your agency, to be acted on upon your return to work.

**Course evaluation**

*At the end of the session you will have:*

- Completed the final course evaluation form

**Course closure and certification:**

*At the end of the session you will have:*

- Received your EAFm Inland course certificate.

## TERMS USED IN THE EAFm TRAINING



When you see this smiley face in the training modules, it indicates that a term is explained in the glossary.

**Adaptive management:** A systematic process for continually improving management policies and practices by learning from the outcomes of previously employed policies and practices. The basic steps of adaptive management are to implement actions, monitor their effectiveness; analyse, use and adapt; and then capture and share learning. Active adaptive management occurs where management options are used as a deliberate experiment for the purpose of learning (Millennium Ecosystem Assessment, 2006).

**Aquatic:** Relating to water. The term “aquatic” is used throughout this document to replace the term “marine” and focus specifically on freshwater and brackishwater fishery environments.

**Aquatic ecosystem:** An aquatic ecosystem is an ecosystem in a body of water. Communities of organisms that are dependent on each other and on their environment live in aquatic ecosystems. The two main types of aquatic ecosystems are marine ecosystems and freshwater ecosystems.

**Artisanal fishery:** A small-scale fishery carried out using traditional fishing boats and gears. See small-scale artisanal fishery.

**Biodiversity:** The variation of life at all levels, ranging from genes to ecosystems. It is more than a count of species and can be characterized by extinctions, reductions or increases of some species, invasions and hybridizations, degradation of habitats and changes in ecosystem processes.

**Capture fisheries:** Fishing for naturally occurring fish using a variety of fishing gears and methods (e.g. trawls, gillnets, seine nets, traps and fence barriers). The term “fishery” refers to harvesting fish that are farmed (aquaculture) or caught in the wild (capture fishery).

**Climate:** The weather averaged over a long period of time (typically 30 years). Climate is what you expect; as opposed to weather, which is what you get (IPCC, 2001).

**Climate change:** A change in the state of the climate that can be identified (e.g. using statistical analysis) by changes in the mean and/or the variability of its properties, and that persists for an extended period, typically decades or longer (IPCC, 2007).

**Climate Change Adaptation (CCA):** Actions taken to help communities and ecosystems moderate, cope with, or take advantage of actual or expected changes in climate conditions. Adaptation can reduce vulnerability, both in the short- and long-term (IPCC, 2007).

**Co-management:** Partnership arrangements between key stakeholders and government to share the responsibility and authority for the management of the fisheries and aquatic resources, with various degrees of power sharing.

**Code of Conduct for Responsible Fisheries (CCRF):** A voluntary guide developed by the Food and Agriculture Organization of the United Nations (FAO) that provides a set of principles on how to develop fisheries and aquaculture sustainably.

**Convention on Biological Diversity (CBD):** Signed by 150 government leaders at the 1992 Rio Earth Summit, the Convention on Biological Diversity is dedicated to promoting sustainable development. It recognizes that biological diversity is about more than plants, animals and microorganisms and their ecosystems – it is about people and their need for food security, medicines, fresh air and water, shelter and a clean and healthy environment in which to live. CBD website <http://www.cbd.int/convention/>

**Development:** Improving human well-being (see below). Note that in sustainable development, it is the development that needs to be sustained.

**Ecological well-being:** The state of the ecosystem in terms of health, biodiversity, supportive structures and habitats and food webs.

**Ecosystem:** 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).

**Ecosystem Approach (EA):** A strategy for the integrated management of land, water and living resources that promotes conservation and sustainable use in an equitable way (CBD, 2000). Often used interchangeably with ecosystem-based management.

**Ecosystem approach to fisheries (EAF):** The purpose of an ecosystem approach to fisheries is to plan, develop and manage fisheries in a manner that addresses the multiple needs and desires of societies, without jeopardizing the options for future generations to benefit from the full range of goods and services provided by marine ecosystems. An ecosystem approach to fisheries strives to balance diverse societal objectives, by taking account of the knowledge and uncertainties of biotic, abiotic and human components of ecosystems and their interactions and applying an integrated approach to fisheries within ecologically meaningful boundaries (FAO 2003). The term was formally adopted at the 2001 FAO Reykjavik Conference and was not limited narrowly to management, but could cover development, planning, food safety and governance that covers the breadth of the FAO Code of Conduct for Responsible Fisheries.

**Ecosystem Approach to Fisheries management (EAFm):** EAFm is a more holistic approach to fisheries management that represents a move away from fisheries management systems that focus only on the sustainable harvest of target species, towards systems and decision-making processes that balance ecological well-being with human and societal well-being, within improved governance frameworks. It is a practical way to achieve sustainable development. It addresses the multiple needs and desires of societies, without jeopardizing the options for future generations to benefit from the full range of goods and services provided by marine ecosystems (Garcia et al., 2003; FAO 2003).

**Ecosystem Approach to Fisheries management plan (EAFm plan):** The output of a planning framework that outlines the objectives and integrated set of management arrangements for a fishery to generate more acceptable, sustainable and beneficial community outcomes.

**Ecosystem-based management (EBM):** A management framework that integrates biological, social and economic factors into a comprehensive strategy aimed at protecting and enhancing sustainability, diversity, and productivity of natural resources. EBM emphasizes the protection of ecosystem structure, functioning and key processes; is place-based in focusing on a specific ecosystem and the range of activities affecting it; explicitly accounts for the interconnectedness among systems, such as between air, land and sea; and integrates ecological, social, economic and institutional perspectives, recognizing their strong interdependences (COMPASS Scientific Consensus Statement, 2005). Often used interchangeably with EA.

**Ecosystem-based fisheries management (EBFM):** The fisheries component of ecosystem-based management, but focused on a single sector. EBFM considers both the impacts of the environment on fisheries health and productivity and the impacts that fishing has on all aspects of the marine ecosystem. Often used interchangeably with an ecosystem approach to fisheries management (EAFm).

**Ecosystem goods and services:** The benefits people obtain from ecosystems. These include provisioning services such as food and water; regulating services such as flood and disease control; cultural services, such as spiritual and cultural benefits; and supporting services, such as nutrient cycling or waste degradation, that maintain the conditions for life on Earth.

**Facilitator:** A person who manages the interactions of other people to achieve an acceptable outcome for all.

**Fisheries management:** An integrated process that controls fishing activities to improve the benefits that society receives from harvesting fish. It includes the activities of (i) information gathering, (ii) analysis, (iii) planning, (iv) consultation, (v) decision-making, (vi) allocation of resources and (vii) formulation and implementation, with enforcement, as necessary, of regulations or rules, which govern fisheries activities. The main aim is to ensure the continued productivity of the resources and accomplishment of other fisheries objectives.

**Fishery management unit (FMU):** The area of the ecosystem and fisheries that is the focus for management under an ecosystem approach to fisheries management. The FMU can be a particular type of fishing, e.g. trawl fishery, and/or a particular resource fishery, e.g. shrimp fishery or a geographic area.

**Fishery resource:** The fish that are harvested, where fish includes molluscs, crustaceans and any aquatic animal.

**Fishing right:** A right to carry out specified fishing activities. Can be a territorial use right (TURF), a community right that allows access by poor small-scale fishers, a right granted through a limited-entry system (e.g. allocated number of fishing days or an individual transferable quota (ITQ)).

**Food security:** The availability of consistent and sufficient quantities of food, access to appropriate and sufficient foods and consumption or appropriate use of basic nutrition and food preparation.

**Food web:** A system of interlocking and interdependent food chains.

**Freshwater Conservation Zone (FCZ):** A clearly defined aquatic space (with associated riparian habitat), recognized, dedicated and managed, through legal or customary means,



to protect critical life stages of aquatic resources (typically fish). Typically, but not always, an FCZ is a no-take area.

**Freshwater ecosystem:** Freshwater ecosystems are a subset of Earth's aquatic ecosystems. They include lakes and ponds, rivers, streams, springs, and wetlands. They can be contrasted with marine ecosystems, which have a larger salt content.

**Goal:** A goal is the long-term outcome that management is striving to achieve. It often refers to a group of inter-related issues.

**Good governance:** See below for definition of governance. Good governance is governance that includes (i) consensus, (ii) participation, (iii) accountability, (iv) transparency and (v) follows the rule of law and is (vi) responsive, (vii) equitable and inclusive and (viii) efficient and effective.

**Governance:** Effective institutions and arrangements for setting and implementing rules and regulations. It includes the planning and implementation mechanisms, processes and institutions through which citizens and governing groups (institutions and arrangements) voice their interests, mediate differences, exercise their legal rights and meet their obligations. Good governance also includes adequate resources and arrangements for compliance and enforcement.

**Habitat:** The environment in which fish and other living aquatic resources live, including everything that surrounds and affects their life, e.g. water quality, bottom vegetation, associated species (including food supplies).

**Human well-being:** The state of the society in terms of health, education, food security, political voice and influence, living environment and economic security and safety.

**Indicator:** A variable, pointer, or index that measures the current condition of a selected component of the ecosystem. Indicators provide a link between objectives and action when they are compared to the target and baseline.

**Inland fishery:** Inland fisheries are any activity conducted to extract fish and other aquatic organisms from "inland waters" (FAO, 1997)

**Integrated management:** The process of simultaneously and synergistically working towards multiple objectives and goals, rather than undertaking separate activities in parallel or sequentially. Integration is carried out at the scale of priority geographical or management areas. For governance, integration means working across sectors.

**Integrated watershed management (IWM):** A process for guiding the management of land, water, and other natural resources in a watershed, to provide the appropriate goods and services while mitigating the impact on the soil and watershed resources. It involves socio-economic, human-institutional, and biophysical inter-relationships among soil, water, and land use and the connection between upland and downstream areas.

**Integrated Water Resources Management (IWRM):** A process that promotes the coordinated development and management of water, land and related resources, in order to maximize the resultant economic and social welfare in an equitable manner without compromising the sustainability of vital ecosystems.

**Illegal, Unregulated and Unreported fishing (IUU):** Illegal fishing is conducted by vessels of countries that are parties to a regional fisheries management organization (RFMO), but operate in violation of its rules, or operate in a country's waters without

permission (This applies in transboundary waters such as large lakes, inland seas and international rivers). Illegal fishing in inland waters also occurs in within national waters, when fishing activities contravenes the fishing laws or regulations of that country. Unreported fishing is catch not reported or misreported to relevant national authorities or an RFMO. Unregulated fishing is conducted by vessels without nationality or that fly the flag of states that are not party to relevant fisheries organizations and who, therefore, consider themselves not bound by their rules (FAO, 2002).

**Large-scale industrial fishery:** The sub-sector of a fishery typically operated by larger vessels equipped with large fishing gear and sophisticated technology, and powered by large engines. Vessels can be owner-operated or owned by large companies.

**Limited access:** A system of fisheries management where the number of fishing vessels and/or fishers is limited to conserve the resource.

**Management goal:** A broad statement of a desired outcome, often a specific theme (e.g. the environment or the fishing communities). Goals are usually not quantifiable and may not have established timeframes for achievement (see vision and objectives).

**Management actions:** Specific actions (controls) applied to achieve the management objective, including gear regulations, areas and time closures (see MPA), and input and output controls on fishing effort, ecosystem manipulations or governance actions.

**Management objective:** What is intended to be achieved through management action.

**Monitoring and Evaluation (M&E):** the process of evaluating the performance of management actions for adaptive management. Participatory M&E is when stakeholders are involved in this process.

**Monitoring, control and surveillance (MCS):** The overall process used to ensure laws, rules and regulations are complied with.

**Objective:** What is intended to be achieved. An objective should be linked to indicator(s) against which progress can be measured. Positive or negative change resulting from the achievement of an objective is an outcome. See vision and goal.

**Open-access:** A system open to anybody who wants to fish and there are no restrictions on the number of vessels and/or fishers.

**Outcome:** The change in status, attitude or behaviour that results from a set of management activities. An outcome should be able to be tracked through measurement and/or observation over time.

**Pelagic species:** Species that live in the upper surface of waterbodies (typically larger lakes and reservoirs).

**Precautionary approach (or principle):** An underlying element of the broader framework of sustainable development. Where there are threats of serious or irreversible damage, lack of full scientific certainty shall not be used as a reason for postponing cost-effective measures to prevent environmental degradation (UNCED, 1992). The United Nations Conference on Straddling Fish Stocks and Highly Migratory Fish Stocks (UN 1995) first articulated the principle for fisheries with the following definition:

“States shall be more cautious when information is uncertain, unreliable or inadequate. The absence of adequate scientific information shall not be used as a reason for postponing or failing to take conservation and management measures” (UN, 1995).

There are two ramifications of the precautionary approach:

1. Lack of data and information should not be used as an excuse for not taking action.
2. Where there is uncertainty, management actions should be more risk averse.

**Promoting agency:** The agency that takes the lead in promoting a new concept, such as EAFm.

**Resilience:** The ability of an ecosystem to maintain key functions and processes in the face of (human or natural) stresses or pressures, either by resisting or adapting to change (Nystrom and Folke, 2001).

**Riparian:** A description of anything that is related to or situated on the banks of a river, or wetland habitat adjacent to rivers.

**Risk:** A function of probability and consequence. Risk assessment is the process intended to calculate or estimate the risk to an object or system. The process includes identifying the severity of a hazard (its impact) and likelihood of it happening.

**Scoping:** Determination of the broad background to the fishery management unit (FMU), including a description of the geographic area, stakeholders, fisheries, critical habitats and issues on which a project or resource management plan must focus.

**Small-scale artisanal fishery:** The fishery sub-sector usually operated by fishers with either no fishing vessels or small fishing vessels and using more traditional fishing gear. Vessels are usually owner-operated and, if powered, powered by small inboard or outboard motors.

**Stakeholders:** Any individual, group or organization who has an interest in (or a “stake”), or who can affect or is affected, positively or negatively, by a process or management decision.

**Sustainable development:** Development (improvement in human well-being) that meets the needs of the present without compromising the ability of future generations to meet their own needs.

**Sustainable fisheries management:** Fisheries management that promotes the contribution that capture fisheries makes to sustainable development.

**Sustainable use:** The harvesting of natural resources that does not lead to long-term decline of the resource and biodiversity, thereby maintaining its potential to meet the needs of the present without compromising the ability of future generations to meet their own needs.

**Sustainability:** Short hand for sustainable development.

**Target:** The objective that management is working towards, expressed as a measurable value; the desired value for an indicator at a particular point in time.

**Trophic:** Relating to nutrition; trophic level: one of the hierarchical strata of a food web characterized by organisms which are the same number of steps removed from the primary producers.

**Vision:** A vision is the top-level aspiration of what the future will look like if management is successful. See goal and objective.

**Voluntary Guidelines for securing sustainable small-scale fisheries (VGSSF):** The FAO Voluntary Guidelines for Securing Sustainable Small-Scale Fisheries in the Context of Food Security and Poverty Eradication represent a global consensus on principles and guidance for small-scale fisheries governance and development. The guidelines are the first international instrument dedicated entirely to the immensely important small-scale fisheries sector. The principles in the guidelines address policies, strategies and legal frameworks concerning small-scale fisheries, but also other matters affecting lives and livelihood in fishing communities.

**Voluntary guidelines on the responsible governance of tenure (VGGT):** The Voluntary Guidelines on Tenure promote secure tenure rights and equitable access to land, fisheries and forests with respect to all forms of tenure: public, private, communal, indigenous, customary and informal. The guidelines serve as a reference and to provide guidance to improve the governance of tenure of land, fisheries and forests with the overarching goal of achieving food security for all and to support the progressive realization of the right to adequate food in the context of national food security.

**Vulnerability:** The degree to which a human or natural system is susceptible to, or unable to cope with, adverse effects of climate change and/or changing freshwater environment or ecosystem, including climate variability and extreme events. Vulnerability is a function of the character, magnitude and rate of change and variation to which a system is exposed, its sensitivity and related adaptive capacity (IPCC, 2001).

**Well-being:** can be defined as a satisfactory condition of existence normally for an individual or society but can also be used to refer to the state of a system (e.g. ecosystem or social system). See ecological and human well-being.

## **MODULE 1: THREATS AND ISSUES IN INLAND FISHERIES**

### **SESSION OBJECTIVES:**

- Identify the threats and issues faced by your fisheries and associated ecosystems.

## OVERVIEW

This module outlines the generic threats and issues, and some related opportunities, in many fisheries (not all will be applicable to specific cases). These issues and threats are summarised under three headings:

- 1) human well-being ☺
- 2) governance ☺
- 3) ecological well-being ☺

In some cases, the opportunities that an EAFm presents for dealing with specific issues and threats are highlighted in italics.

### 1. THREATS AND ISSUES AFFECTING HUMAN WELL-BEING

#### Population and economic growth

- High population growth rates have resulted in an increasing food requirement in many inland regions and this includes the demand for fish. National demand, and the increasing export pull from developed countries, is putting enormous pressure on freshwater fisheries resources.
- Whilst economic development ☺ and improving lifestyles may also result in an increased demand for fish, the numbers of fishers may be reducing as fishing becomes an increasingly unattractive livelihood due to the reduced returns from degraded fisheries..

#### Food security☺

- In areas where there is a high dependence on inland fisheries amongst the poorest segments of society, results in fisher households becoming particularly vulnerable to impacts on inland fisheries.
- This may involve large numbers of people in developing, low income, food deficit countries.
- Capture fisheries ☺ have for the most part reached their limits, and left unmanaged, it is not reasonable to expect more production volume, yet human population and demand continues to rise and increased production targets are set annually in a number of countries.
- Many fisher communities have few alternative livelihood options and have limited capacity to cope with degradation of their inland fishery ☺ from overfishing or environmental impacts (such as pollution, damming of rivers and changing water availability).
- In the drive for increased fish production, against a backdrop of generally weak governance and management, fishing can reach high intensities; cause significant 'fishing down of the food web' ☺ in the most extreme cases. This results in a shift to lower trophic ☺ levels and size classes in the catch. This has impacts on fish for food in small-scale fisheries, as well as broader ecosystem ☺ impacts, affecting the quality and resilience ☺ of the fishery at large.

### **Fishing is increasingly unprofitable**

- Economic development and declining catches mean that fishers increasingly need to increase fishing effort, including the use of illegal gears, to sustain fish catches and incomes.

### **Poor health infrastructure and vulnerability ☹ to HIV/AIDS**

- Due to their physical and socio-economic isolation, many fishing communities lack adequate sanitation, clean water and health care. The rates of HIV infection in some fishing communities can be five to ten times higher than those in the general population. Poor health and premature death robs fishing communities of productive people, the knowledge gained by experience and reduces incentives for longer-term and inter-generational stewardship of resources.

### **Gender**

- In many situations women play a prominent role in processing and marketing fish and are often actively engaged in fishing ☺.
- Fisheries management actions ☹ introduced may impact on women's livelihoods and their ability to provide income for their families/households.
- Women's views are important for achieving support for fisheries management planning and may be a strong force for advocating sustainable fishing and compliance with management actions.

### **Conflicts**

- Increasing fishing effort may result in conflict between resource users over the declining harvestable stocks.
- Conflicts between local and (seasonal) migrant fishers are common
- Conflicts may also occur on larger water bodies, between small-scale fishers ☺ and larger-scale fishing ☹ operations.
- Conflict between small-scale fishers other aquatic ☺ resource users (irrigation, agriculture, hydropower, tourism and aquaculture ☺) and jurisdictional (e.g. irrigation and power generation) authorities is becoming more frequent.
- There can also be conflicts between those who fish for food and those who fish for recreation. Wealth disparity between groups can drive conflicts and lead to inequitable outcomes ☹

### **Technological advances**

- Technological advances, such as the introduction of motorization (fuel efficient and easy to maintain engines), improved materials such as monofilament nets, light attracting devices and cell phones, have enabled fishers to exploit fisheries more intensively and efficiently than was ever imagined, even a few decades ago.
- In many cases such advances have contributed to conflicts between fishers and led to overfishing



### Climate ☺ related threats to resilience and vulnerability to natural disasters

- Freshwater ecosystems ☺ are vulnerable to climate driven factors such as floods and droughts, as well as unseasonal temperature changes. Some inland fishing communities are prone to disasters (storms/cyclones, floods, etc.) and all inland fisheries will be affected to some degree by longer-term climate change ☺ and variability (changing agricultural production and water demand, need for hydropower, changing water flows).
- All of these could have significant long-term destabilizing impacts on socio-economic systems.
- Broader climate variability issues related to this include: destabilization of rural populations, increased migration and access to freshwater.

## 2. GOVERNANCE THREATS AND ISSUES

### Open access ☺ regimes

- Many inland fisheries in developing countries are open access fisheries and there are few, if any, limitations on entry to these fisheries.
- Some developed countries have moved to limited access ☺ to conserve fishery resources ☺.
- In many cases, fishing is no longer a full-time livelihood. Some fishers now use their knowledge and skills to support recreational fishing and tourism.

### Decentralization of management of natural resources

- Many countries in the region have gone through or are going through decentralization processes, but for fisheries management ☺ these processes have often been poorly planned or ad hoc, and many important governance linkages have not been established.
- Although many local governments are now responsible for fishery and aquatic resource management, they often do not have a broader vision ☺ and may not have the institutional capacity or be able to address issues that are external to their jurisdictions.
- They may also have very weak integration between agriculture/irrigation water use, fishery management and environmental protection and conservation. This leads to planning outcomes that may undermine each other, and the loss of benefits from ecosystem services such as fisheries.

### Weak resource management

- Under decentralization policies, local governments often have responsibility for managing fisheries and aquatic resources. In many cases, local government fishery offices may lack the technical skills or financial resources needed to plan and manage these fisheries adequately.

- **Opportunity:** *The EAFm provides a practical planning approach that allows prioritization of issues to be undertaken within the practical realities of local conditions and capacities.*
- Local fishery management may tend to be reactive, rather than proactive, meaning that problems are often resolved using short-term solutions that may not address the underlying causes.
- **Opportunity:** *The EAFm provides a structured governance framework to proactively address the underlying issues by taking a more thoughtful long-term perspective to planning and management.*

### Stakeholder participation

- Fishery and aquatic resource management decision-making may not adequately involve fishers or other stakeholders 😊, which often leads to a lack of support for the management actions developed. These actions may be fishery focused (e.g. gear measures, spatial measures, etc.) or focused more generally on other ecological goals 😊 (e.g. capture fisheries 😊, biodiversity 😊 conservation, protection of critical habitats or species, etc.).
- **Opportunity:** *The EAFm relies on adequate identification of, and participation by, stakeholders in the process of developing EAFm plans 😊 and thus generates greater support for and ownership of the resulting decisions.*
- **Opportunity:** *where stakeholders have differing objectives 😊 (e.g. fishing versus conservation), proactive stakeholder engagement can increase opportunities to achieve an agreeable balance that achieves diverse societal and ecological outcomes 😊.*
- **Opportunity:** *engagement with higher-level authorities can increase political commitment to the EAFm plan and enable its recognition and institutionalization.*

### Co-management 😊

- With rapid decentralization taking place, many national governments have relinquished authority to “communities” where resource conflicts may be best resolved locally and ‘tailor-made’ rules established that take local conditions fully into account.
- *Opportunity: co-management is an alternative to “top-down” management. As stakeholders can participate more actively in fishery projects and programs, decisions about how to manage and use benefits from fishery resources can be made through shared processes. Thus, communities of local resource users and governments at different jurisdictional levels can share the responsibility and authority for management.*
- Conflict management often goes hand in hand with co-management.

### Compliance and enforcement

- Lack of enforcement often undermines many initiatives and emphasizes the importance of having local government support to assist in enforcement (both within jurisdictions and between adjacent jurisdictions).

- Involving communities in co-management may involve community fishery patrols to ensure laws and local rules are being followed.
- Community-based and local (e.g. district level) management ☺ actions may be recognized under the authority of decentralized natural resource management, but do not have legal authority. This means that there may not be an effective system for enforcement and compliance, or even an ability to punish offenders.

### Corruption and rent seeking

- Demands for illegal payments for boat/gear registration, fishing licenses/permits or access rights by authorities are a common and pervasive form of alleged corruption in the fishery sector.
- Corrupt practices, such as taking payments and permitting illegal fishing practices to occur and permitting illegally caught fish to be sold in the market, can contribute to fisheries laws/rules being ignored and fish stock and biodiversity decline.
- Some forms of corruption are more subtle, such as influencing the passing of laws and ordinances or government policies that are intended to benefit the vested interests of influential persons with fishing operations or companies.

### Sustainable management conflicts with production promotion and revenue generation

- Local governments generate revenue based on trade and production, so their policies tend to support drives for greater production.
- This tends to deter authorities from engaging in policies or regulation to limit or constrain fishing effort, and is often in direct conflict with the longer-term sustainability of fisheries.
- It may also result in policies that favour a limited number of more intensive operations, over a larger number of small-scale operators.

### Political and institutional planning horizons are short-term

- Fishery management plans, stock recovery efforts, legal/institutional changes often take several years before tangible results are achieved. Any failures in commitment or changing policies or priorities can undermine these plans before they have had sufficient time to achieve success.
- *Opportunity: developing an EAFm plan provides an opportunity to institutionalize longer-term political, financial and institutional commitments beyond the usual shorter-term financial planning cycles (e.g. budgets are usually planned annually and political terms of governors and mayors may be only two to three years).*
- *Opportunity: developing an EAFm plan and the associated monitoring and evaluation, can enable greater continuity and commitment to longer-term planning.*

### Unintended negative consequences of subsidies

- Short-term economic fluctuations (e.g. cost of fuel, inflation) or the availability of fish (sometimes due to poor recruitment years) may lead to calls from the fishery

for support to cope with the crisis. These “crises” are often a result of the fishery operating very close to a financial breakeven point.

- In fisheries, where employment and infrastructure are linked to the larger-scale fishing, governments may provide support to help the fishery survive a short-term crisis.
- Unfortunately, this support may be sustained well beyond resolution of the original problem and thus contribute directly to supporting trends in overfishing or overcapacity of the fishing fleet or infrastructure.
- Indirect subsidies include welfare schemes or infrastructure development that, once in place, support the argument for sustaining higher levels of fishing capacity or effort than the ecosystem can support.

### Structure of fishery management arrangements

- The workforce employed in fisheries/aquaculture agencies and research institutes are rarely fully mobilized to provide pro-active planning for better fisheries management.
- In many areas this workforce and resources are being used mainly to collect statistical information, provide welfare and subsidies and occasionally to resolve conflicts.
- **Opportunity:** *The EAFm allows the direction of efforts to resolve the most pressing management issues and upon delivering results can motivate and encourage stakeholders to buy-in to the stakeholder driven process.*

### Alignment of science with fisheries management needs

- A significant amount of research related to fisheries is not directly of use to fishery and aquatic resource managers. Many researchers are not effectively linked to the fishery management systems and academic research may be poorly targeted.
- Lack of scientific integrity or independence in fishery research can result in a lack of trust by fisheries stakeholders.
- **Opportunity:** *The EAFm provides a framework for stakeholder dialogue and developing greater understanding and trust between science, resource management and the fisheries sectors.*

### Fishing rights 😊

- A well-defined and appropriate system of access rights in a fishery produces many benefits, most importantly ensuring that fishing effort is commensurate with the productivity of the resource and providing fishers and fishing communities with longer-term security that enables and encourages them to view the fishery resources as an asset to be sustainably managed through responsible stewardship.
- Basing fishing rights only on economic efficiency in resource use is not typically an acceptable approach in developing countries, since it often results in social impacts, particularly to livelihoods in the small-scale fishery sector.

- For most inland small-scale fisheries, the main tool to assure rights and support more effective management may be a system of community rights. These can protect the rights of access by poor small-scale fishers and offer a degree of protection from the impacts of larger-scale commercial fishing.
- Equally, larger-scale commercial fishing operators who may have significant capital investments, must have clear rights to operate, providing they are compliant with management actions.
- There are several different types of use rights.
  - Territorial use rights for fishers (TURFs) assign rights to individuals or groups to fish in certain localities.
  - Limited-entry systems allow only a certain number of individuals or vessels to take part in a fishery, with entry being granted by way of a license or other form of permit.
  - Alternatively, entry may be regulated through a system of effort rights (input rights – e.g. fishing days) or by setting catch controls (output rights). In the latter case, the total allowable catch (TAC) is split into quotas and the quotas are allocated to authorized users (noting that these can be difficult to implement where there are large numbers of fishers).
- Although these systems are still rare, some countries are trying to close new entry to segments of the fisheries and most countries have forms of zoning that allocate fishing areas to particular segments of the fishery. For example, in large water bodies, such as Lake Malawi, a near-shore artisanal fishing zone may exclude larger-scale gears, such as trawls and seine nets. Compliance with these actions remains a significant obstacle to their effectiveness.
- **Opportunity:** *implementing an EAFm will require the allocation of rights in most, if not all, fisheries. It is worth noting that many countries do not have clear legislation that allows the allocation of TURFs to fisheries, although traditional rights systems often allow this and may be recognized as legitimate in some countries.*
- Under decentralized government, local authorities may have the authority to legally recognize a fishery management plan, but this may not extend to excluding the rights of outsiders to fish in the managed area, merely that they should comply with the management actions agreed for that area.
- Each type of use right has its own properties, advantages and disadvantages and the ecological, social, economic and political environment varies from place to place and fishery to fishery.
  - No single system of use rights will work under all circumstances.
  - It is necessary to devise a system that best suits the general objectives and context for each case and this system may well include two or more types of use rights within an EAFm plan for a geographic area (fishery management unit ☺ discussed later).
  - For example, a fishery on a large water body, that includes artisanal and commercial fishers could make use of TURFs (fishing zones), effort controls (fishing days and seasonal closures) and catch quotas to regulate access in

the different segments of the fishery. Input and output controls could be combined in a way that suits the nature of each and gives due attention to the productivity of the resources.

### 3. THREATS AND ISSUES AFFECTING ECOLOGICAL WELL-BEING ☺

The need to manage fisheries and aquatic resources in the context of the larger supporting ecosystem, including aquatic habitats and environmental conditions, is widely acknowledged in most countries. In many areas of the world, the principal impacts on inland fisheries do not originate from the fishery itself but from outside the fishery.

The dilemma lies in reconciling a countries' need to sustain or increase the capture fishery harvests for food security and livelihoods, with the competing demands for water and water resources from irrigation, agriculture, hydropower generation, industry and other users. There is also the need to maintain the ecological integrity of aquatic ecosystems ☺ and the sustainability of fish stocks.

#### Impacts on the ecosystem

- Freshwater fisheries and aquaculture invariably take place in multiple-use environments, but often are considered secondary activities, particularly in reservoirs meant for irrigation, hydropower, flood-control or water supply.
- In most countries, inland waters suffer from multiple competing demands for water (e.g. hydropower, withdrawal for agriculture, industrial processes or transportation). This results in trade-offs between sustaining freshwater fisheries and other uses of water (See Table 1.1.)
- Decisions on water management often fail to take into account, impacts on fish and fisheries and on the rural livelihoods of the populations that depend on them
- Pollution and watershed impacts also affect water quality and this has impacts on aquatic biodiversity and fishery food chains. It may also impact fish directly through toxic effects.
- Besides the external drivers, there is also significant excess fishing effort in some fisheries. This has led to the reduction, or even disappearance, of economically and culturally valuable target fishery stocks or groups of species.
- Fishery declines are common areas where water development (irrigation, hydropower) have created physical barriers that limit floodplain connectivity and impede natural movement and migration of wild stocks. These barriers prevent access to spawning, nursery and growth habitats. Fish end up spawning in the wrong place at the wrong time or not at all.
- These management failures are partly because inland fisheries are poorly understood and greatly undervalued in water management at local, national, and basin levels.
- There is also weak understanding as to how to minimize these impacts and optimize water management to support fisheries (e.g. through improved connectivity, sustaining environmental flows and enhancing water productivity).



- Aquatic ecosystems, once significantly impacted, may have limited capacity or resilience ☺ to return to their original state. The ecosystem goods and services ☺ provided to dependent communities may be lost and actions need to be taken to reduce or mitigate impacts, or seek ways to sustain or improve fish production from altered habitats and fish stocks.
- **Opportunity:** *The EAFm allows the threats to the long-term sustainability of the fishery to be viewed alongside the needs of competing sectors. Trade-offs and compromise agreements can be reached on actions to mitigate or reduce impacts or enhance compliance with those actions.*

### Impacts on fishery resources

- Overfishing can lead to changes in the structure or composition of fish species in an ecosystem.
- In cases where there is heavy fishing pressure, the targeting of juveniles or broodstock can lead to declining recruitment and lost fishery productivity.
- Some fishing activities can have impact on other vulnerable biodiversity (e.g. the entrapment of mammals and birds in fishing nets)
- Direct habitat damage (use of poisons, explosives; or dragging contacting gears, such as pushnets and beach seines) impacts on breeding and nursing areas and can change the ecosystem's ability to sustain the original diversity of species.
- Targeting of vulnerable life stages, or fishing in areas where fish are concentrated (such as dry-season refuges, or close to barriers such as dams, weirs and regulators) can have a strong impact on fishing pressure. It may also lead to conflict between fishers.
- **Opportunity:** *The EAFm allows agreements to be reached between fishers on how to ensure that benefits are distributed more equitably and to reduce conflicts that arise over the targeting of vulnerable stocks.*

### Other impacts that will affect the fishery and the ecosystem

- Climate change and climate variability is already leading to changes in aquatic ecosystems and these changes are projected to increase in the coming years and decades. Changing water flows and temperatures strongly affect aquatic ecosystems.
- Climate change will lead to changes in freshwater habitats and the fish assemblages that they support: only a few of these effects are expected to be beneficial to inland fisheries, especially those based on native fish populations.
- Freshwater ecosystems have relatively low buffering capacity and are therefore relatively sensitive to climate-related shocks and variability. There is a wide range of physiological and ecological impacts on both fish and the freshwater ecosystems supporting inland fisheries related to water temperature, water availability and flow, and other ecological perturbations.
- Direct (and indirect) climate change impacts may see considerable shifts in species compositions, but overall productivity might be sustained because of the high diversity and resilience typically shown by tropical systems.



- Fish migrations may alter and species can shift their ranges in response to changing temperatures. As a result, fish availability may change, impacting fisher livelihoods.
- Habitat loss and saline intrusion is expected to increase in river delta areas. This will affect species compositions and production.
- Increasing pollution and organic run-off results from intensification of agriculture will tend to have negative impacts on freshwater fisheries.
- Although inland fisheries will be impacted by climate change, there are potential opportunities and gains for inland fisheries that can be captured by its effective integration into the adaptation plans of other sectors.
- The increase in water storage, in response to uncertain precipitation and water stress will see increased reliance on culture-based fisheries as well as freshwater aquaculture development
- Significant adaptation approaches will focus on the benefits from integration of inland fish into broader environmental management plans and integrated water and land management (particularly hydropower, irrigation, and the commitment to maintaining environmental flows).
- Effective integration of inland fisheries considerations into aquaculture adaptation is important to limit potential maladaptation issues from interactions relating to invasive species, genetic and health impacts.
- **Opportunity:** while many of these problems require solutions outside the fishery sector, the use of an EAFm allows these externalities to be recognized and potentially opens the way for constructive dialogue and finding solutions for mitigating of the worst impacts

**Table 1.1:** Direct drivers of change in inland fisheries (From UNEP, 2010).

DRIVER	IMPACT ON ECOSYSTEM
<i>Dam construction</i>	Alters timing and quantity of river flows, leading to loss of breeding and feeding habitats
	Alters water temperature, nutrient and sediment transport, leading to mortality of fish and fry
	Results in loss of floodplain and other wetlands
	Blocks fish migrations, preventing access to breeding and feeding areas and in time reduces population levels
<i>Dike and levee construction</i>	Destroys hydrologic connection between river and floodplain habitat, so reducing breeding and feeding habitat
<i>Diversions</i>	Reduce river flow leading to loss of breeding and feeding habitat
<i>Draining of wetlands</i>	Loss of key aquatic ecosystems and breeding and feeding habitats for fish

DRIVER	IMPACT ON ECOSYSTEM
<i>Deforestation/land use changes to agriculture development</i>	Alters runoff patterns and increases sedimentation leading to loss of fish habitats and mortality of eggs and larvae,
<i>Agriculture development</i>	Reduces habitat and water quality and quantity
<i>Urbanisation</i>	Reduces habitat and water quality and quantity
<i>Navigation</i>	Straightening and dredging of channels resulting in loss of channel length and habitat diversity
	Separation of floodplain from channel
<i>Release of polluted water effluents</i>	Diminishes water quality, leading to fish mortality
	Leads to changes in composition of plankton and other organisms: alters food chains and changes composition of fish communities
<i>Overharvesting</i>	Depletes fish populations
	Alters food chains and biodiversity
	Shifts fish catch to smaller species and individuals
<i>Introduction of exotic species</i>	Eliminates native species, alters biodiversity, food chains, production and nutrient cycling
<i>Acid deposition</i>	Alters chemistry of rivers and lakes leading to loss of fish habitat and decline in populations
<i>Climate change</i>	Changes in runoff patterns from increase in temperature and changes in rain fall, leading to changes in flow regimes i.e. flooding and low flows, as well as in breeding and feeding habitats

**Activity:** Discuss issues and threats for fisheries and associated ecosystems, and keep for later activities

## **MODULE 2: FISHERIES MANAGEMENT AND THE ECOSYSTEM APPROACH**

### **SESSION OBJECTIVES:**

- Realize that a broader management approach is required to address the many threats and issues facing inland fisheries;
- Recognize how inland ecosystems benefit human societies;
- Describe the concept of the ecosystem approach (EA);
- Explain some of the benefits of using an EA.

## OVERVIEW

This module explains the need for an ecosystem approach (EA) ☺ to manage natural resources. It firstly sets the context and justification for more effective fisheries management. It then looks at the different elements of fisheries management and characteristics typical to existing inland fisheries management. Finally, it covers the benefits (goods and services) that ecosystems provide and explains how EA can help address the challenges to current fisheries management.

## INTRODUCTION AND CONTEXT

Inland fisheries provide substantial and important social, economic, and cultural benefits, with global inland fishery production reported at 11.47 million tonnes of fish (2015). This is equivalent to the full, dietary animal protein of 158 million people. At least 43 percent (4.9 million tonnes, 2015) of the world's inland fish capture harvest comes from 50 low-income food deficit countries (LIFDCs). There are plausible reasons to consider that the total global inland fishery catch figure may be an underestimate. Based on the modelling of inland fisheries catch using household consumption surveys total global inland fishery catch has been estimated to be 64.8 percent higher than officially reported.

Inland capture fisheries employ between 16.8 million and 20.7 million people, with a further 8 million to 38 million employed in the related post-harvest sector. This represents about 2.5 percent to 6 percent of the global agricultural workforce. Women represent more than 50 percent of the workforce in inland fisheries.

The economic value of inland freshwater fisheries catches (as reported to FAO) is estimated to be approximately USD 26 billion per year. The major contributions to this come from Asia (66.1 percent) and Africa (22.2 percent). If the hidden catch of inland fisheries is included in the valuation, the estimated total use value of inland freshwater fisheries rises to USD 38.53 billion. This value is further increased to USD 43.53 billion if the value of freshwater molluscs and crustaceans is included.

The value of capture fisheries is somewhat dwarfed by the use values generated by recreational fishing in developed countries. Globally, the 2015 non-market use value (NMUV) of recreational fishing is estimated to lie somewhere between USD 64.55 billion and USD 78.55 billion. Aggregating the NMUV of inland recreational fisheries and the use value of inland capture fisheries indicates that the total use value of the inland fishery sector is worth an estimated USD 108 billion to USD 122 billion annually.

## STATE OF INLAND FISHERIES

Freshwater ecosystems are some of the most impacted ecosystems on the planet. This is an inevitable consequence of humankind's need for water for a wide range of productive activities.

The general degradation of freshwater ecosystems and the consequent impacts on living aquatic resources has greatly reduced the potential benefits that inland fishing can provide. This has had a disproportionate impact on rural communities that are dependent upon these resources for their food security and livelihoods.

Inland fisheries face a number of serious challenges. Decades of overfishing and habitat degradation have led to declines in many inland fisheries. The majority of resources found in these overfished waters are now the fast growing, short-lived species such as

“Usipa” (*Engraulicypris sardella*), and “Kapenta” (*Limnothrissa miodon*) that have high turnover rates and short recovery periods for biomass rehabilitation.

Effort restrictions, habitat ☺ protection, and other management actions have the potential to yield fairly immediate, positive, results in terms of stock recovery. Longer-lived species that have been overfished will take longer to recover, if ever, and will usually require specific additional management actions.

The degraded state of inland fisheries has come about through governments and stakeholders being slow to adopt sustainable development principles and sustainable fisheries management ☺ practices. Instead they have focused on increasing production, (either fish or other food production systems requiring large amounts of water, such as rice).

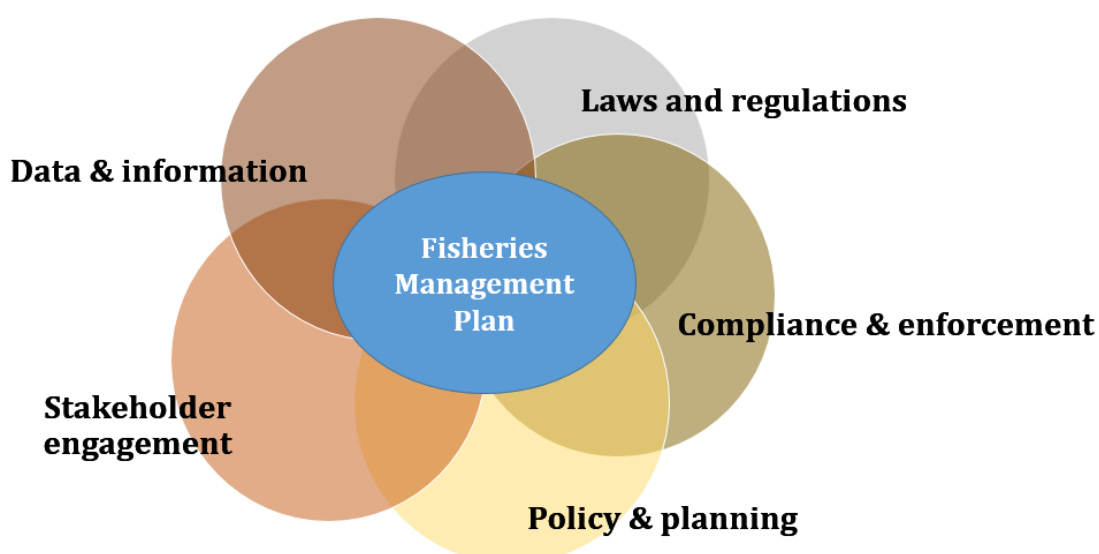
If left unmanaged, fisheries usually develop to a point where the fisheries resources become so degraded that the socio-economic returns are much less than those potentially available. These declining returns affect food security, poverty alleviation, employment and national revenue (and rent). However, experience in several parts of the world has shown that major inland fishery ecological damage can be reversed and that economic waste from inland fisheries can be reduced.

## FISHERIES MANAGEMENT - A QUICK OVERVIEW

### What is fisheries management?

Fisheries management ☺ can be thought of as an integrated process to control fishing in ways that will improve the benefits that society receives from harvesting fish from an ecosystem. It includes the activities of (i) information gathering; (ii) analysis; (iii) planning; (iv) consultation; (v) decision-making; (vi) allocation of resources; and (vii) formulation and implementation, with enforcement of regulations or rules to limit fisheries activities. The main aim of fisheries management is to ensure continued productivity of the resources and the accomplishment of other fisheries objectives ☺ usually set out in a Fisheries Management Plan. The main activities are shown in Figure 2.1.

**Figure 2.1:** Main activities involved in fisheries management.



## What is a fisheries manager?

A fisheries manager is a person who coordinates different fisheries management activities for a given fishery. In particular he/she manages the (i) process of informed decision-making, formulation and implementation of rules and regulations, (iii) compliance and enforcement, (iv) allocation of resources and (v) negotiation.

**Group activity:** Discuss what you understand by fishery management in your country based on your experience.

Sort the threats and issues identified earlier into those that (i) can be addressed by existing fisheries management and (ii) those that cannot be addressed by existing fisheries management.

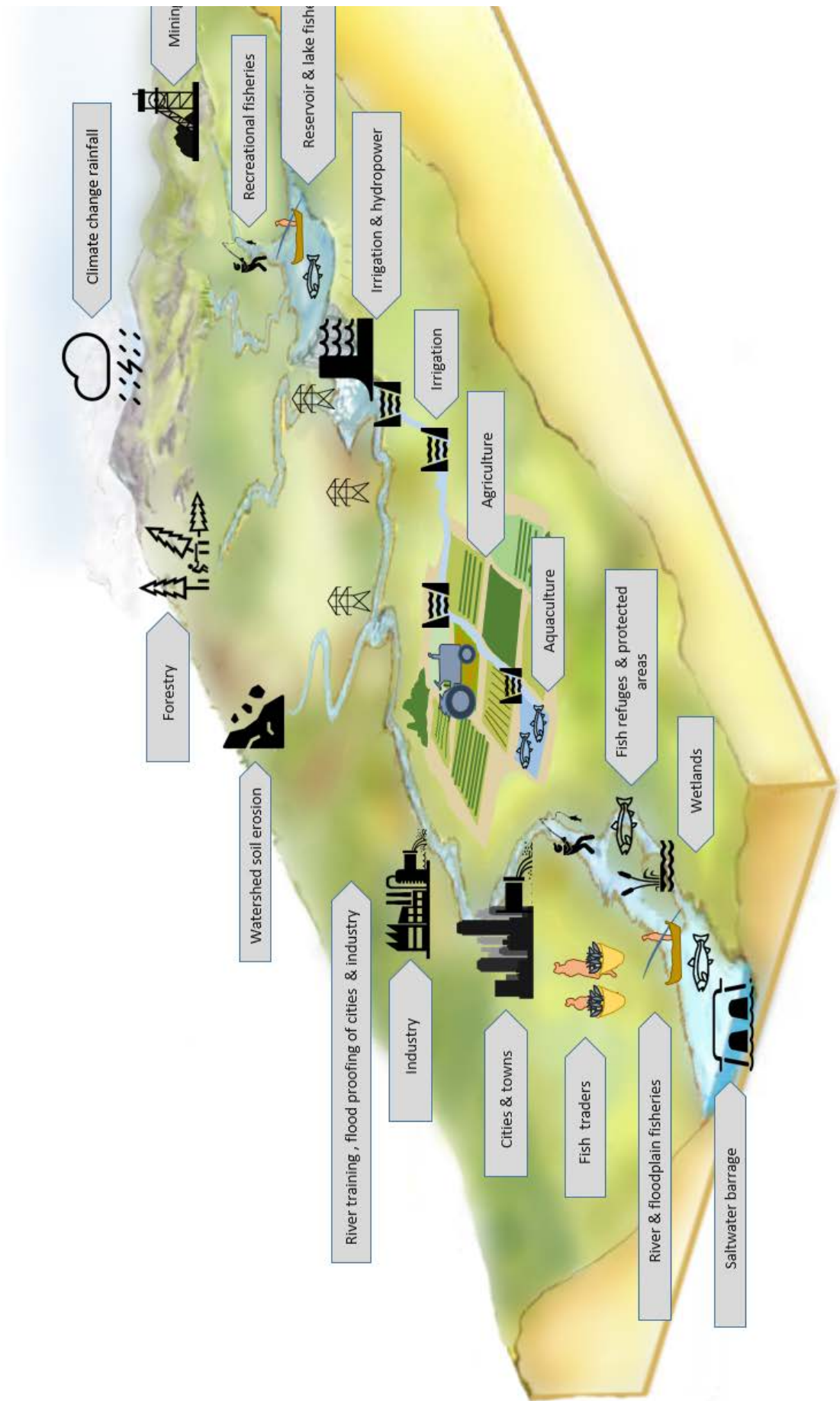
Historically, fisheries have been managed from a mainly sectoral perspective. There are few examples of well-managed fisheries with the objective of maximizing the benefits (often considered as economic benefits) whilst trying to ensure that the catch is commensurate with the natural productivity of the harvestable stocks. In many other fisheries the main objective of management has been to reduce stakeholder conflict. This is often linked to the aim of increasing overall production.

Existing inland fisheries management initiatives commonly have characteristics such as:

- focused on (a) target species;
- single sector specific (fisheries);
- management actions that focus on control of fishing effort (e.g. gear restrictions and zones);
- stock assessment based; and
- aim to reach biological management objectives (e.g. increased production).

If we consider the wide scope of threats and issues facing fisheries and their supporting ecosystems, it is obvious that existing inland fisheries management usually does not cover them all and a broader, more inclusive approach that includes more elements of the freshwater ecosystem is needed (Figure 2.2).

**Figure 2.2:** A typical fishery system and linkages within the aquatic ecosystem (Source: FAO)





## BENEFITS OF ECOSYSTEMS

### 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).

It is important to understand that many of the elements in an ecosystem are interconnected and changes to one element can have a flow-on effect on others. For example, overfishing of the top predators can create drastic changes to the whole food web.

### ECOSYSTEM SERVICES AND BENEFITS 😊

It is important to recognise the multiple benefits that freshwater ecosystems provide to human societies. These benefits can be called “ecosystem services” and include:

- supply of fish for food;
- livelihoods and incomes of fishers and fishing communities through harvesting, processing and trade;
- cultural, recreational and traditional heritage values;
- economic development through tourism, trade and transport; and
- water purification, water retention, flood protection and resilience against climate variability and change, as well as natural disasters.

The services are often categorised as:

- supporting – food webs for plants and animals;
- provisioning – supply of fish for food, wood for timber;
- regulating – freshwater purification and water supply and resilience against variability and change, as well as protection from floods and other natural disasters.
- cultural – recreation, cultural and traditional heritage values; and

In a fisheries context, fish species depend upon their surrounding and the supporting ecosystems and are affected by a range of fishing activities, other human activities, and natural processes. Fishing can impact aquatic ecosystems by: (1) catching unwanted species (bycatch); (2) causing physical damage to benthic and riparian habitats; (3) changing species composition; and (4) disrupting food chains. Other human activities unrelated to fishing, such as agricultural land use and run-off, forestry, irrigation, hydropower, and introduced species and pathogens can also affect aquatic ecosystems, including the many species they contain. In addition, human and natural impacts on freshwater ecosystems are increasingly being exacerbated by the effects of human-induced climate change.



## THE ECOSYSTEM APPROACH AND SUSTAINABLE DEVELOPMENT

The ecosystem approach (EA) is now accepted as the management approach applicable to a range of scales, sectors and multi-sectoral approaches. This term “ecosystem approach” (EA) was first coined in the early 1980s, but found formal acceptance at the Earth Summit in Rio in 1992, where it became an underpinning concept of the Convention on Biological Diversity (CBD) ☺ that defined it as:

*“A strategy for the integrated management of land, water and living resources that promotes conservation and sustainable use in an equitable way.”*

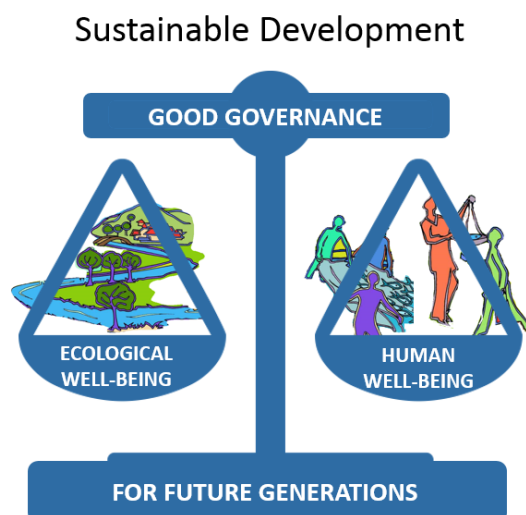
The application of the EA helps to balance the three objectives of the CBD ☺: conservation; sustainable use; and the fair and equitable sharing of the benefits arising from the utilization of genetic resources. In effect, the EA can be thought of as the way to introduce sustainable development ☺, a concept that has replaced earlier development policies based on economic growth only.

Sustainable development is defined by Brundtland (1987) as:

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

Note that “development” in this definition refers to improvements in human well-being and that it is this development that needs to be sustainable. This means that we need to find a balance between ecological well-being and human well-being, so that development does not degrade the natural resource base upon which it is dependent, but also avoids the overprotection of resources that could constrain development. This balance between human and ecological well-being can only be achieved through good governance ☺ (Figure 2.3).

**Figure 2.3.** Sustainable development –balancing ecological well-being and human well-being through good governance.



It is widely accepted that “well-being” ☺ is a concept that refers to the state of a system (e.g. ecosystem or social system). Specific aspects of the two dimensions of well-being and what is meant by good governance are outlined below.

### ECOLOGICAL WELL-BEING

There are five major aspects of ecological well-being that are relevant to aquatic ecosystems:

- healthy ecosystems that maximize ecosystem goods and services;
- biodiversity that maintains ecosystem resilience;
- supportive ecosystem structures and habitats (incl. connected watersheds);
- healthy lakes, rivers, wetlands, watersheds; and
- food webs based on diverse sources of primary production.

Ecosystem health is often expressed using indicators ☺ in terms of measurable characteristics that describe:

- key processes that maintain stable and sustainable ecosystems (e.g. water quality to support life is sustained and there is an absence of factors causing deoxygenation, such as eutrophication and algal blooms);
- zones of human impact that do not expand or deteriorate (e.g. a reduction in the spatial extent of agricultural and sewage nitrogen and phosphorus); and
- critical habitats that remain intact (e.g. riparian ☺ habitats, flooded forests, wetlands/swamps, water meadows).

### HUMAN WELL-BEING

Human well-being refers to all human components that are dependent upon, and affect, the ecosystem. Human well-being reflects the various activities or achievements that constitute a ‘good life’. It is also accepted that well-being is a multidimensional concept that embraces all aspects and levels of human life. Income, on its own, although an important component, cannot adequately capture the breadth or complexity of the concept of human well-being.

Eight aspects of human well-being are:

- Material living standards (income, food and wealth);
- Health;
- Education;
- Personal activities (recreation and work);
- Political voice and governance;
- Social / cultural connections and relationships;
- Living environment (present and future conditions); and
- Economic security and human safety

These aspects are founded on the belief that measuring human well-being goes beyond subjective self-reports and perceptions, and must include an objective measure of the

extent of peoples' "opportunity set" and their capacity (or freedom) to choose from these opportunities in a life they value. Both objective and subjective factors are important in the measurement of the eight aspects listed above.

### GOOD GOVERNANCE ☺

Refers to effective institutions and arrangements for setting and implementing rules and regulations that balance ecological and human well-being. In brief, good governance is related to stewardship where individuals, organizations, communities and societies strive to sustain the qualities of healthy and resilient ecosystems and their associated human populations. Stewardship takes the long-term view and promotes activities that provide for the well-being of this and future generations. Good governance is considered in more detail in [Module 4 Principles of EAFm](#).

### BENEFITS OF USING THE ECOSYSTEM APPROACH (EA)

**Plenary brainstorm:** Discuss the benefits of taking an ecosystem approach.

There are many benefits of EA. The main ones include:

- Facilitates the trade-offs necessary to balance human and ecological well-being
  - enables consideration of diverse stakeholder priorities;
  - balances production with conservation of biodiversity and habitat protection;
  - and helps resolve conflict.
- Allows adaptive management ☺
  - leading to more effective inland fisheries planning
  - can be applied in data poor situations.
- Increased stakeholder participation and more transparent planning processes
  - increased equity in access and the use of aquatic ☺ resources;
  - recognizes cultural and traditional values; and
  - protects the fishing sector from the impacts of other sectors and vice versa.
- Provides a way to consider large-scale, long-term issues (e.g. climate change)
- Secures increased political support
  - fosters political and stakeholder participation; and
  - can help unlock financial resources.

The term ecosystem based management (EBM) ☺ is often used interchangeably with EA, but in some contexts, focuses more on the ecological/environmental dimension of sustainable development.

Once the benefits that ecosystems bring to human societies and the benefits of the EA are fully recognized, it becomes possible to understand the need for managing these ecosystems more holistically (i.e. beyond a focus on fish only). The benefits of an EA when applied in a fisheries context are discussed in the next Module.

Note that the EA/EBM does not replace sectoral management, i.e. management of fisheries and agriculture, management of the manufacturing industries, management of

agriculture, irrigation, hydropower, forestry and mining. If applied correctly it integrates management across (i) different interests within a sector (e.g. harvesting a resource and its environmental impact); (ii) across sectors; and (iii) takes into account externalities such as climate change (see [Module 15 Step 4](#)).

## **MODULE 3: THE WHAT AND WHY OF EAFm?**

### **SESSION OBJECTIVES:**

- Describe what EAFm is;
- Describe the benefits of using an EAFm;
- Explain how EAFm fits in with other approaches;
- Recognize the complexities of multiple societal objectives.

## OVERVIEW

This module explains that EAFm is the ecosystem approach applied to the fishery sector, and is an approach to improve the contribution of fisheries to sustainable development. As such, EAFm has three components – ecological well-being, human well-being and good governance. An EAFm is discussed alongside other fisheries approaches; and the key elements that make EAFm different are highlighted.

## DEFINING EAFM

EAFm ☺ is simply EA applied to fisheries. In other words:

**“EAFm is a practical way to implement sustainable development principles for the management of fisheries by finding a balance between ecological and human well-being through good governance.”** (Adapted from EAFNet: What is EAFm?).

**“EAFm represents a move away from management systems that focus only on the sustainable harvest of target species, to a system that also considers the major components in an ecosystem, and the social and economic benefits that can be derived from their utilisation”** (FAO 2012).

**“EAFm is the ecosystem approach applied to fisheries  
i.e. a practical way to implement sustainable  
development and sustainably maximize ecosystem  
benefits of a fishery system”**

The word ecosystem is used to address the fishery system as an integrated socio-ecological system, with humans being an integral part of the ecosystem (see definition in **Module 2 Fisheries management and the ecosystem approach**).

The EAFm can be applied to a range of fisheries environments including offshore, inshore and inland fisheries. This manual is dedicated to developing EAFm for inland scenarios, which may include brackish water environments.

## BENEFITS OF ECOSYSTEMS

EAFm has at its heart, both human well-being and ecological well-being. Thus it strives to balance the conservation of biodiversity and ecosystem structure and functioning, with the human need for harvesting resources for food, income and livelihoods. To achieve this balance an EAFm requires an effective governance framework.

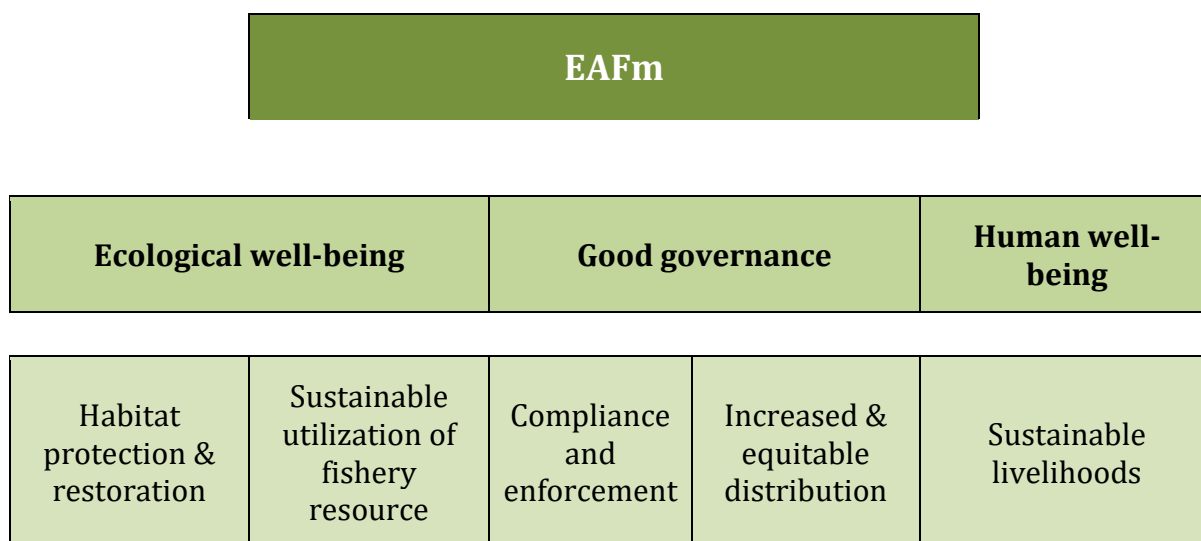
## THE THREE COMPONENTS OF EAFM

Sustainable development can be summarized as a balance between ecological well-being and human well-being that does not compromise the needs of future generations **Module 2 Fisheries management and the ecosystem approach** (Figure 2.3).

Because EAFm is a way to achieve sustainable development in fisheries, it has the three components used in the ecosystem approach (Figure 3.1):

1. Ecological well-being
2. Human well-being
3. Good governance

**Figure 3.1:** The three EAFm components with fisheries examples



## WHY AN EAFM? – THE BENEFITS

The management benefits of an EAFm include:

- broader consideration of the links between ecosystems and fisheries;
- contributions to more effective resource use planning;
- facilitation of trade-offs between different stakeholder priorities, balancing human and ecological needs;
- increased stakeholder participation leading to:
  - better planning of resource uses; and
  - more equitable use of natural resources (both fishery and non-fishery related);
- help with balancing fish production with conservation of biodiversity and habitat protection;
- help with resolving or reducing conflicts between stakeholders;
- greater recognition of cultural and traditional values in decision-making; and
- enabling larger-scale, longer-term issues to be recognized and incorporated into fisheries management (e.g. long-term implications of climate change, habitat degradation, population growth, economic development, globalization, etc.).



Table 3.1 below outlines how the features of EAFm enable it to address the many threats and issues in fisheries (see previous module on threats and issues facing fisheries). The left-hand column also refers to the main sections in this Handbook, which are relevant to each specific feature.

**Table 3.1:** How the features of an EAFm can address threats and issues common to many inland fisheries

Features of EAFm	How this feature helps address threats & issues facing fisheries
<p><b>1. Helps provide financial resources</b></p> <p><a href="#">Module 8 Startup A</a> <a href="#">Module 14 Steps 3.4 and 3.5</a></p>	<ul style="list-style-type: none"> <li>• Helps coordinate input and services from different groups, such as government institutions, fisheries agencies, and other stakeholders. Improves communication with decision-makers who can release funding.</li> <li>• The longer-term time horizon of the EAFm plan allows for budgetary planning.</li> <li>• A more coherent EAFm plan engages with governance and can unlock resources.</li> </ul>
<p><b>2. Helps gain political and stakeholder support</b></p> <p><a href="#">Module 4 Principles of EAFm</a> <a href="#">Module 8 Startup A</a> <a href="#">Module 9 Startup B</a> <a href="#">Module 12 Reality Check I</a></p>	<ul style="list-style-type: none"> <li>• Support is gained politically through the inclusion of local government, and activities outside the fishery that will affect the fishery.</li> <li>• Greater support from the judiciary.</li> <li>• Harmonization with environmental departments/ministries.</li> <li>• EAFm allows the identification of information and research needs by connecting scientists/academics with the planning process, which leads to research relevant to management and improved communication with stakeholders.</li> </ul>
<p><b>3. Increases support for better governance</b></p> <p><a href="#">Module 9 Startup B</a> <a href="#">Module 12 Reality Check I</a> <a href="#">Module 11</a> <a href="#">Module 13</a> <a href="#">Module 14 Steps 2.1-2.3, 3.1-3.5</a></p>	<ul style="list-style-type: none"> <li>• Political support can lead to better laws and enforcement.</li> <li>• Stakeholders increased compliance with management actions.</li> <li>• Allows women's issues and perspectives to be included in planning.</li> <li>• Takes into account the needs of value chain participants e.g. fish processors needing raw materials.</li> <li>• Gives a voice to small-scale fishers.</li> </ul>
<p><b>4. Helps identify and address conflicts across divergent societal objectives</b></p> <p><a href="#">Module 11 Steps 2.1, 2.2</a> <a href="#">Module 12 Reality Check I</a></p>	<ul style="list-style-type: none"> <li>• Ensures human economic and social well-being are taken into account.</li> <li>• Balances conflicting policy objectives within and between sectors.</li> <li>• Opens dialogue between users and identifies solutions through conflict management mechanisms.</li> <li>• Identifies and directs effective subsidies, (or redirects ineffective subsidies).</li> </ul>

Features of EAFm	How this feature helps address threats & issues facing fisheries
	<ul style="list-style-type: none"> <li>• Aligns conservation versus fisheries production objectives.</li> <li>• Helps identify and resolves conflict issues between large and small-scale fishers.</li> </ul>
<p><b>5. Helps protect the fishing sector from the impacts of other sectors</b></p> <p><a href="#"><u>Module 8 Startup A</u></a>  <a href="#"><u>Module 11 Steps 2.2-2.3</u></a></p>	<ul style="list-style-type: none"> <li>• Works with other sectors. For example: <ul style="list-style-type: none"> <li>○ Irrigation water supply</li> <li>○ River and wetland connectivity</li> <li>○ Urban, industrial pollution</li> <li>○ Agricultural runoff</li> <li>○ Habitat damage.</li> <li>○ Subsidies in agriculture</li> <li>○ Hydropower development</li> <li>○ Tourism development.</li> <li>○ Deforestation</li> <li>○ Unregulated aquaculture development.</li> <li>○ Conservation actions that do not consider their impact on fisheries and access to fisheries.</li> </ul> </li> </ul>
<p><b>6. Helps protect other sectors from the impacts of fishing</b></p> <p><a href="#"><u>Module 8 Startup A</u></a>  <a href="#"><u>Module 11 Steps 2.2-2.3</u></a></p>	<ul style="list-style-type: none"> <li>• Habitat impacts.</li> <li>• Allows bycatch issues to be better addressed.</li> <li>• Allows better integration of conservation and natural resource protection actions.</li> <li>• Gives attention to biodiversity conservation and ecosystem integrity and support services.</li> </ul>
<p><b>7. Protects different sub-sectors of the fisheries sector from negative impacts on each other</b>  <b>Module 8 Startup A</b></p> <p><a href="#"><u>Module 13</u></a>  <a href="#"><u>Module 14 Steps 3.1, 3.2 &amp; 3.3</u></a></p>	<ul style="list-style-type: none"> <li>• Includes all sub-sectors impacts, including <ul style="list-style-type: none"> <li>○ Overfishing of juveniles impacting on the value of the fishery.</li> <li>○ Aquaculture development impacts on fisheries (e.g. demand for feed and access to areas).</li> </ul> </li> </ul>
<p><b>8. Provides mechanism to link management across political and jurisdictional scales and boundaries</b></p> <p><a href="#"><u>Module 4 Principles of EAFm</u></a>  <a href="#"><u>Module 12 Reality Check I</u></a>  <a href="#"><u>Module 16 Reality Check II</u></a></p>	<ul style="list-style-type: none"> <li>• Decentralization means that national fisheries agencies may no longer have a remit to address local user conflicts and issues of user well-being.</li> <li>• Promotes co-management and collaboration between government agencies from municipal, district, provincial, and national agencies, in addition to key stakeholder groups.</li> </ul>
<p><b>9. Promotes communication between stakeholders, both within the fishing sector and outside it</b></p>	<ul style="list-style-type: none"> <li>• Addresses any lack of dialogue between fisheries and other departments/ministries, such as environment, water sectors, agriculture/irrigation, hydropower, industry.</li> </ul>

Features of EAFm	How this feature helps address threats & issues facing fisheries
<p><b>Module 9 Startup B</b> <b>Module 15 Step 4.1</b></p>	
<p><b>10. Can be used in data poor situations</b></p> <p><b>Module 10 Step 1.3</b> <b>Module 17 Steps 5.1 and 5.2</b></p>	<ul style="list-style-type: none"> <li>• Uses both local/traditional knowledge and scientific knowledge.</li> <li>• Monitoring and review feedback mechanisms allow new relevant information to be gathered and adaptively incorporated into management cycle.</li> <li>• New information increases understanding of the socio-ecological system.</li> </ul>
<p><b>11. Promotes long-term ecosystem and fisheries sustainability</b></p> <p><b>Module 17 Steps 5.1 and 5.2</b> <b>Module 12 Reality Check II</b></p>	<ul style="list-style-type: none"> <li>• Focuses on longer time horizons that allow incorporation of longer-term environmental and social changes into planning process.</li> <li>• Incorporates projected social changes (e.g. population growth and development) and the impacts of climate change.</li> </ul>

## MOVING FROM EXISTING FISHERIES MANAGEMENT APPROACHES TO AN EAFm

As described above, the main objective of EAFm is the sustainable use ☺ of the whole ecosystem, not just the exploitation of a single species. However, in many cases the application of an inland EAFm does not mean starting anew, as an EAFm will build on some elements of existing fisheries management. EAFm also tends to happen incrementally and may take years to move all management elements to a 'full EAFm'. Table 3.2 shows the characteristics typical of existing fisheries management in relation to the EAFm.

**Table 3.2:** A comparison of 11 elements of management under typical existing fisheries management and under an EAFm

Management element	Existing approaches	EAFm
<i>Species considered</i>	Mainly target species.	All species in the ecosystem, particularly those impacted by fishing.
<i>Management objectives</i>	Relate mainly to target species and conventionally focused on biological objectives for maximising sustainable yield.	Multiple objectives covering the fisheries, ecosystem goods and services and socio-economic considerations.
<i>Scale</i>	Addresses fisheries management issues at the stock/fishery scale.	Addresses the key issues at the appropriate spatial and temporal scales. These are often nested (local, national, sub-regional, regional, global).

Management element	Existing approaches	EAFm
<i>Data and information used</i>	Mainly scientific data focusing on target species.	Broader knowledge base (both scientific and traditional) that emphasizes learning by doing (adaptive management).
<i>Assessment methods</i>	Largely stock assessment for key target species.	Multi-species and ecosystem assessments through indicators.
<i>Management intervention</i>	Mainly control of fishing.	Broad-based incentives (including ecosystem tools such as Fish Conservation Zones/Protected Areas (PAs) ☺). Links with Integrated Watershed Resource Management (IWRM) ☺ and broad-based incentives.
<i>Planning</i>	Usually in the form of a Fisheries Management Plan that considers target species.	The EAFm plan considers the fishery, ecosystem and human systems and governance.
<i>Stakeholders</i>	Fishers, fishing industry/communities.	Broader stakeholders: people affected by or who affect EAFm
<i>Sectors</i>	Sectoral, i.e. focuses mainly on fisheries sector issues.	Deals more explicitly with the interactions of the fishery sector with other sectors, e.g. irrigation and hydropower development, tourism, aquaculture, watershed and forestry land management.
<i>Policy and decision-making</i>	Largely at the government level. Addresses mainly corporate (fisheries sector) interests.	Participatory with major stakeholders. Addresses the interests and aspirations of broad stakeholder communities.
<i>Participation</i>	Top-down (command and control) approaches typify conventional fisheries management.	Participatory approaches, e.g. various forms of co-management are a key feature of EAFm.
<i>Compliance and enforcement</i>	Operates through regulations and penalties for non-compliance.	Encourages compliance with regulations through incentives.

Implementing an EAFm can result in higher management costs, due to the broader data and information requirements, the multi-stakeholder planning and consultative decision-making process, as well as a wider scope for monitoring implementation.

Although the potential cost increases of an EAFm should be outweighed by the longer-term human and ecological benefits, the question of “who pays?” will often be important, especially in a transition phase of implementation. The idea that the beneficiary pays

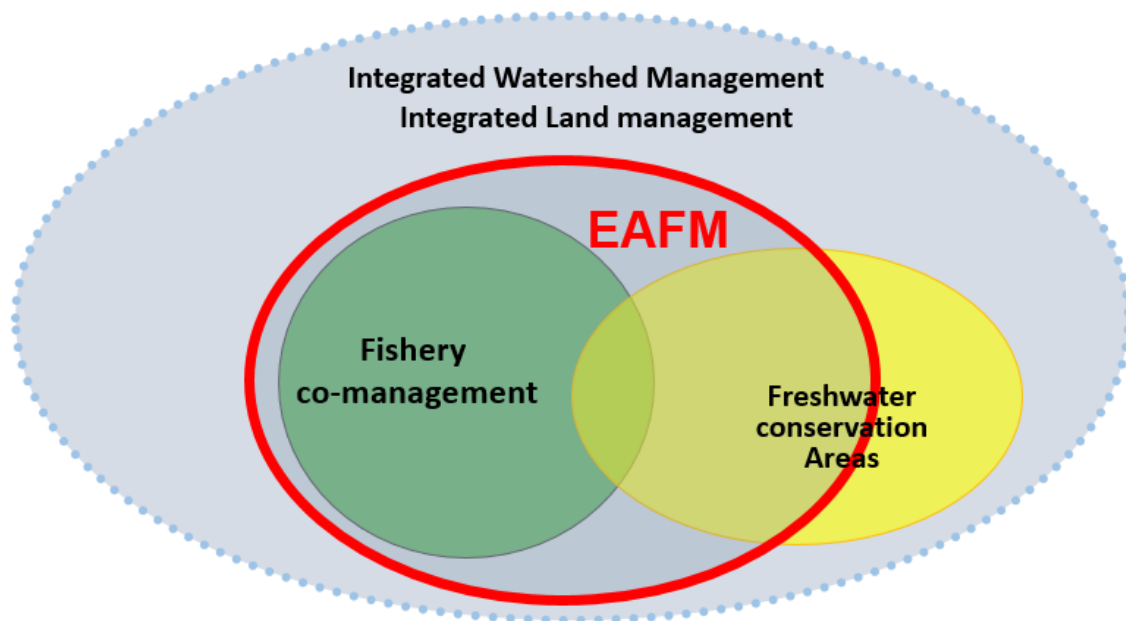
(user pays) is becoming increasingly accepted. Because EAFm also responds to wider societal needs, costs theoretically should be divided between those people who are benefiting directly, such as fishers, and society at large.

## OTHER APPROACHES

EAFm complements and integrates numerous existing approaches to fisheries and aquatic resource management. Co-management that ensures multiple stakeholder decision-making and ownership is at the heart of EAFm (see [Module 9 Startup B and Module 12 Reality check I](#)). Both Integrated Water Resource Management (IWRM) ☺ and Integrated Watershed Management (IWM) ☺ have a lot of overlap with EAFm as management approaches. IWM is EA/EBM across different sectors applied at the watershed or even river basin level and depending on one's entry point to the EA, IWM can be thought of as a management action for achieving EAFm objectives. These approaches are all nested within the EA/EBM concept (Figure 3.2).

All these approaches recognize that management must deal with broad ecosystem management (both natural and human components) whilst trying to optimize the social and economic benefits.

**Figure 3.2:** EAFm complements other approaches



## INTEGRATED WATER RESOURCES MANAGEMENT

Integrated Water Resources Management (IWRM) ☺ presently is the international accepted water policy tool to develop holistic water management plans. It is a process that promotes the coordinated development and management of water, land and related resources, in order to maximize economic and social welfare in an equitable manner without compromising the sustainability of vital ecosystems. An IWRM approach is cross-sectoral and should be an open, flexible process which brings all stakeholders to the table for policy agreements and the implementation of actions to address water challenges.

Both IWRM and EAF are based on ecosystem approaches and are in line with the wider principles identified by the Convention on Biological Diversity (CBD). IWRM is therefore highly complementary to the EAF (in balancing diverse human, environmental and economic outcomes) and the inland EAFm can be considered as a fishery-focused tool for use within the broader IWRM framework<sup>1</sup>.

### CO-MANAGEMENT

Co-management is the sharing of decision-making and responsibility for the management of resources between a community and their local or national government. It is a partnership arrangement in which government, the communities of local resource users, external agents (NGOs, academic and research institutions), and other resource stakeholders share the responsibility and authority for the management of a local natural resource. Co-management is not a regulatory technique. It is a participatory and flexible management strategy that provides and maintains a forum or structure for action on participation, rule-making, conflict management, power sharing, leadership, dialogue, decision-making, negotiation, knowledge generation and sharing, learning, and development among resource users, and government.

Figure 3.3 below illustrates the spectrum of natural resources management options that can be used; from full management control by government to full management control by the community. It is rare that such extremes exist. Any space between these two extremes can be classified as a type of co-management. Full community-based management should not be seen as an eventual goal. However in many cases there will be a need to strengthen co management through moving from left to right on the diagonal.

**Figure 3.3.** The relationship between co-management, community-based management and government-based management (adapted from Pomeroy and Berkes, 1997)



The amount/level of joint management varies in each co-management system according to the degree that state entrusts management to communities, or level of control that the state is able to exert in the fishery

<sup>1</sup> For more on the history of Integrated Water Resources Management: United Nations Conference on Water (Mar del Plata 1977); International Conference on Water and Environment (Dublin 1992) Second World Water Forum & Ministerial Conference (The Hague 2000); International Conference on Freshwater (Bonn 2001); World Summit on Sustainable Development (Johannesburg 2002) *Plan of Implementation* includes IWRM; The Third World Water Forum (Kyoto 2003)



Due to the multi-stakeholder participation in the EAFm process, many EAFm plans will be built around the concept of Co-management, or focus on ways to shift management, (in the diagram above), from left to right.

### CONSERVATION ZONES/PROTECTED AREAS

Use of Fishery Conservation Zones ☺ (and other forms of aquatic protected area) is often part of planning for protection within IWRM and EAF. Conservation zones or protected areas are really another management tool and should be used in conjunction with other fishery and aquatic resource management actions (see [Module 14 Step 3.3](#)). As a tool, they can potentially address both fisheries management and conservation considerations, but have often been applied primarily to address conservation of biodiversity concerns, rather than fisheries. Indeed, some freshwater protected areas may be established primarily as critical habitat and migration route-resting areas for migratory waterbirds, and have little or no consideration for the freshwater fisheries they support.

Furthermore, it is not uncommon for such areas to be established without consultation with fishery stakeholders, decreasing the chance of success.

Conservation measures can benefit or impose livelihood costs on local stakeholders, therefore the equitable sharing of costs and benefits is a major challenge when conservation tools are implemented. In many countries, this difficulty is compounded by the fact that, at the public sector level, there are multiple agencies from the fisheries, environment and other sectors, often working at cross-purposes. Greater cross-sector integration helps achieve more equitable sharing of the costs and benefits of conservation zones as part of a fisheries management toolbox.

### COORDINATION

In many cases, the required management action will lie outside the scope of the fisheries agency and there is a need for better cooperation between agencies and stakeholders, especially during the planning stages of EAFm.

Initiatives such as IWRM can provide a platform for this, but fisheries agencies are often absent in decision-making or have marginal influence relative to other more influential actors (e.g. irrigation, agriculture, hydropower, WASH).

Establishing the presence of a fishery agency or advocates for fisheries within this broader planning framework is an important step. It typically requires pre-planning of issues and needs (through EAFm) as well as the collation of information on issues and values related to fisheries.

Once this important step has been achieved, day-to-day management of fisheries can then be left to the fisheries agency to deliver, with regular meetings of other concerned stakeholders to assess progress and resolve any conflicts that may have arisen.

**Activity:** Balancing different societal objectives. Discuss trade-offs.



## **MODULE 4: PRINCIPLES OF EAFm**

### **SESSION OBJECTIVE:**

- Examine the principles of EAFm and their links to the FAO Code of Conduct for Responsible Fisheries (CCRF).
- Revisit your threats and issues and cluster them according to the three EAFm components;
- Realize that you are already doing some aspects of EAFm;
- Analyze your current fisheries practices and identify what EAFm you are already doing;
- Identify gaps in your EAFm practices and possible ways to move forward.

**Activity:** Develop a time line of key events that have shaped your fisheries.

## OVERVIEW

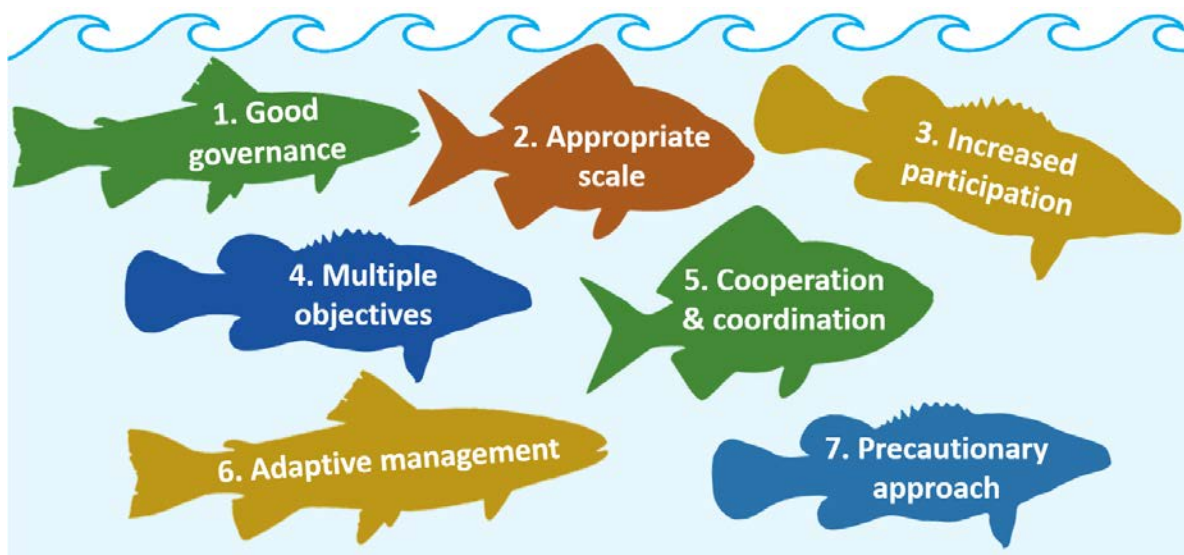
This module outlines the principles of EAFm: (i) good governance, (ii) appropriate scale (iii) increased participation, (iv) multiple objectives, (v) cooperation and coordination, (vi) adaptive management, and (vii) precautionary approach ☺.

## INTRODUCTION

EAFm is a broader and more holistic approach to managing fisheries. As a result, there are a few key differences between existing fisheries management approaches and an EAFm. The following considerations will help identify where these differences lie and how your current approach to fisheries management could be adapted to move closer to full EAFm.

## PRINCIPLES OF EAFm

**Figure 4.1.** Key principles of EAFm



The seven key EAFm principles (Figure 4.1) can be summarised as follows:

1. **Good governance** that aims to balance ecological and human well being
2. **Appropriate scale** that takes into account connections within and across ecosystems and social systems (these connections can be place-based; across different environments: water-land-air; and across scales, i.e. district/regional/national/international).
3. **Increased participation** of key stakeholders in planning and M&E phases.
4. Management for **multiple objectives** (balancing societal trade-offs entails working across scales and different stakeholder objectives; the aim is to develop objectives that address multiple challenges/concerns).

5. **Cooperation and coordination** both vertically across different levels of government and society, and horizontally across agencies and sectors.
6. **Adaptive management** ☺ that embraces change through learning and adapting. The key is to have flexible systems and processes, including feedback loops that allow for learning through doing.
7. Use of the **precautionary approach** where uncertainty exists.

## EAFm PRINCIPLES AND THE FAO CODE OF CONDUCT FOR RESPONSIBLE FISHERIES

The EAFm principles are based on a set of guiding principles first put forward in the FAO Code of Conduct for Responsible Fisheries (CCRF) ☺. The CCRF is voluntary, although parts are based on international law, (including those of the 1982 United Nations Convention on the Law of the Sea (UNCLOS)). The CCRF covers all aspects of management and development of fisheries, including capturing, processing and trade in fish products, fishing operations, aquaculture, fisheries research and the integration of fisheries into integrated resource management. There are also linkages to the Convention on Biodiversity (CBD), and to non-binding agreements such as the Aichi Targets and the UN Sustainable Development goals (SDGs)

The CCRF sets out some important principles for responsible fisheries (see Box 4.1 for those relating to fisheries resources and the ecosystem and Box 4.2 for those relating to the social and economic dimensions of sustainable development). These principles were developed before the concept of EA and EAFm were fully articulated. The seven EAFm principles that we will use in this course have been drawn from the basic concept of sustainable development that is set out in the CCRF.

### Box 4.1: Main principles of the CCRF relating to ecological well-being.

- The primary responsibility for decisions affecting the environment and living aquatic components rarely lies with a fishery authority but with other agencies. Fisheries interests are often peripheral to environmental policy-making and allocation process in most countries. This may require special effort to engage with decision makers.
- Maintain fishery resources for present and future generations.
- Prevent overfishing and excess capacity to ensure that fishing effort is commensurate with the productive capacity of the resources.
- Apply the precautionary approach, do not wait for perfect knowledge before acting but act with appropriate caution.
- Manage not only the target species but all aquatic species belonging to the same ecosystem.
- Protect and rehabilitate critical habitats.
- Ensure fishery interests are taken into account in the multiple use of aquatic resources zones and are integrated into area management plans (adapted from FAO 2003)
- Conservation of inland aquatic resources should be viewed within the multi-purpose use of river and lake basins. In most inland waters the principle

constraints on the system and its living components may come from human activities other than fishing.

- Undertake appropriate environmental assessments and monitoring with the aim of minimizing adverse ecological changes and related economic and social consequences.

#### **Box 4.2: Main principles of the CCRF relating to human well-being.**

- Fishers or their representatives should participate in the setting of priorities for freshwater ecosystem use representing the interests of the fishery and contributing to the mitigation of any undesirable effects of their own activities.
- Base conservation and management actions on the best scientific advice (environmental, social, and economic) available, taking into account traditional knowledge.
- Apply a user pays principle: Users of freshwater should minimize any deleterious effects and contribute to the mitigation of any impacts of their activities and to rehabilitate the systems when the need for their activity has ceased.
- Protect the rights of fishers and fish workers, particularly those involved in artisanal ☺ small-scale fisheries, to a just livelihood as well as preferential access, where appropriate.
- Promote the contribution of fisheries to food security and food quality, giving priority to the needs of local communities.

## **EAFM PRINCIPLES IN DETAIL**

### **GOOD GOVERNANCE ☺**

Governance is the way that rules are established and implemented. It includes the mechanisms, processes and institutions through which citizens and governing groups voice their interests, mediate differences, exercise their legal rights and meet their obligations (AusAID, 2000). Governance is often a complex mixture of formal and informal processes (institutions) that may involve a geo-political entity (e.g. nation-state government), a socio-political entity (e.g. chiefdom, tribe, family, etc.), or any number of different kinds of institutions and arrangements.

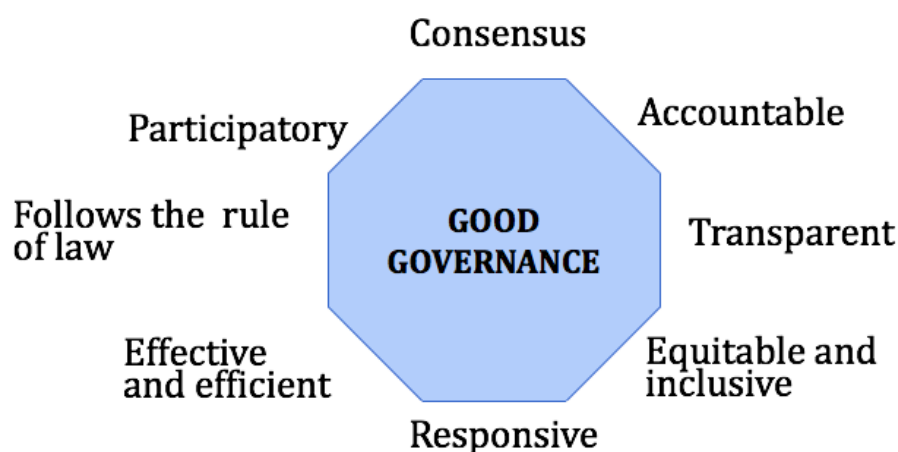
Good Governance includes the following desirable elements:

- political support;
- legal authority to (co-) manage;
- effective institutions;
- coordination arrangements with government, external agents, resource user groups and community members;
- community support through participatory processes;
- enforcement and compliance;
- collaborative decision-making processes;

- information and data to support monitoring and learning-by-doing;
- adequate and dedicated resources (personnel, funding, equipment) for co-management;
- staff skills and commitment; and
- consideration of external factors affecting governance – market forces, climate change, natural disasters, level of socio-economic or human development, etc.

Whilst the concept of “governance” is descriptive, the idea of “good governance” is *standard-setting*, i.e. normative in nature. The exact meaning of “good governance” varies according to the policy area in question, but there are eight general characteristics of good governance (Figure 4.2).

**Figure 4.2:** Characteristics of good governance



Source: <http://www.unescap.org/pdd/prs/ProjectActivities/Ongoing/gg/governance.asp>

**Accountable:** the governing body should be able and willing to show the extent to which its actions and decisions are consistent with clearly-defined and agreed-upon objectives. It should be responsive to the present and future needs of society.

**Transparent:** the governing body’s actions, decisions and decision-making processes should be open to an appropriate level of scrutiny by other parts of government, civil society, communities and in some instances, outside institutions and governments. This ensures corruption is minimized.

**Responsive:** the governing body should have the capacity and flexibility to respond rapidly to societal changes and take into account the expectations of civil society in identifying issues of public interest. It should be willing to critically re-examine its own role, periodically.

**Equitable and inclusive:** the governing body should ensure that the views of minorities are taken into account and that the voices of the most vulnerable in society are heard in decision-making processes.

**Effective and efficient:** the governing body should strive to produce quality public outputs, including services delivered to citizens, at the least cost, and ensure that outputs meet the original intentions of policymakers.

**Rule of law:** the governing body should legislate and enforce transparent laws, regulations and codes.

**Participatory:** by actively involving male and female stakeholders in consultation and decision-making, the governing body hopes to foster ownership and support of policies.

**Consensus oriented:** the governing body strives to achieve a broad consensus on policy to foster policy acceptance.

Good governance for EAFm must ensure both human and ecological well-being, including the equitable allocation of benefits. In fisheries, where management and exploitation occur largely out of the public view (even though the fishery is often managed by the public sector), accountability is of great importance. As a means of ensuring accountability, access to information and transparency in policy are critical. This access is a precondition for meaningful public participation in decision-making.

Policy effectiveness can be improved through decentralized management, as measures can be tailored to local needs and increased opportunities be given to local stakeholders through their participation in decision-making.

As a path towards good governance, there are several aspects of organizational behaviour that may be useful:

- establish simple, non-competing mandates for agencies;
- provide information to governmental and non-governmental actors;
- restructure intra-governmental arrangements to reduce opportunities for interagency jurisdictional conflict;
- restructure organizational incentives to create longer time horizons for agency leaders and personnel; and
- manage conflicts of interests that fuel corruption.

### APPROPRIATE SCALE

EAFm aims to achieve sustainable fisheries management by using ecologically relevant boundaries rather than political or administrative ones. This is a departure from traditional fisheries management that tended to work within political or administrative boundaries. The reality is that the scale at which fishery management occurs will be primarily determined by jurisdictional and political boundaries, but there are some general socio-economic and ecological issues that, if considered, can help broaden the mandate of fisheries management. Bear in mind that there is no consensus on how best to factor in these considerations and this is because the scale of a fisheries management unit (FMU) will depend on the aims and goals of that specific fishery (see also **Module 10 Step 1.3** and **Module 16 Reality Check II**).

Scaling can be considered in four dimensions, three of which align to the three components, (human well-being, ecological well-being & good governance) of EAFm:

1. Ecological scales
2. Socio-economic scales
3. Political/governance scales
4. Temporal scales

### Ecological scaling

The following aspects of ecological scaling should be considered:

**The distribution and behaviour of important species:** For example, spawning migrations may happen upstream, but the fishery may be located downriver or across a floodplain; nursery areas and habitats ☺ may feed into fishing grounds.

**Large-scale processes:** For example, annual changes in rainfall and temperature that occur as part of natural cycles as well as being driven by climate change. Monsoonal rains and winds driving large water body upwelling and turnovers. Some of these processes are annual and other vary across decadal time scales. El Nino cycles greatly affect weather patterns across the world.

**Smaller-scale features:** For example, the distribution of habitats, flooding of river floodplains, the 'pulsing' of large lakes.

**Food web processes:** Food web ecology looks at the structure and dynamics of species feeding relationships and abundance. It focuses on the underlying processes of feeding behaviour, consumer-resource interactions, community assemblages, diversity, complexity, productivity and predator-prey relationships. The food web scale needs to be considered in EAFm, as it helps to understand links between species and wider ecosystem functions, including the impact of fisheries on the environment and the impact of the environment on fisheries.

### Socio-economic scaling

A fishery can comprise a single community or be spread along a watercourse such as a river. It may also be made up of various large and small-scale operators working from different landing sites. This affects the way that stakeholders are identified and how different groups are engaged with during the EAFm planning process.

Furthermore, these characteristics are dynamic, not static and as such they may change over time, whether seasonally or over longer time frames. This is because the areas where fishers go to fish are influenced by a variety of issues, such as:

- cultural norms (“we have always fished here”);
- fish migration patterns
- changing preferences (driven by market demand);
- price of fuel; and
- migrant fishers, illegal fishers.

### Governance scaling

The legal and jurisdictional scale of the FMU should be nested within a wider framework that spans all levels, from local community to provincial, national, sub-regional, regional



and global. The paradox of scale dictates that even if EAFm is done at the smallest, most local scale, a number of institutions across the different governance scales should still be involved in decision-making processes that might influence what may happen inside the FMU.

A longer-term goal for EAFm in a country might be to have a harmonized governance arrangement that allows for FMU goals and policies to be realized within the context of a broader, national framework. The reality is that the starting point will usually be the pre-existing governance arrangements, and mechanisms need to be put in place over time that allow for management decisions made in the FMU to influence/harmonize across different governance scales.

### Temporal scaling

EAFm requires a change in focus from obtaining short-term benefits from the fishery to seeking long-term ecosystem benefits. As we have learnt, sustainable development is based on generating equity via “development that meets the needs of the present without compromising the ability of future generations to meet their own needs”. Trade-offs will need to be made so that long-term benefits can be realized. At times, this may result in “winners” and “losers” in which the “losers” may need to be compensated (an action avoided by most governments). Ecosystems also change over time and EAFm will require a shift in time considerations, e.g. an expansion from short-term foci like annual catch limits, to longer time frames/objectives that include environmental variability and climate change.

### Is there a “correct” scale to expand fisheries to a broader ecosystem context?

There is probably no “correct” scale to expand fisheries to a broader ecosystem context. However, scaling issues do require careful consideration because incorrect choices on scale can lead to sub-optimal social, economic or ecological outcomes for the fishery.

As a baseline, all major fishing gears for the main species being co-managed must be included e.g. small-scale and large-scale industrial fishing ☺ gear and vessels.

In reality, the scale for EAFm will be a compromise. Many definitions of EAFm suggest “meaningful ecological boundaries” and this is relatively straightforward when dealing with a large water body such as a reservoir or large lake. However, it becomes more complex when dealing with large rivers and their floodplains.

The ecosystem boundaries for a sedentary or non-migratory species (e.g. molluscs or “blackfish” species) will be considerably different from those of a highly migratory riverine species and even more so for the anadromous species (such as eel, sturgeon, or salmon).

There will always be activities and impacts outside of the EAFm unit that can affect what goes on inside it. These externalities should not be ignored but considered and dealt with through appropriate governance scaling and increased cooperation and coordination across institutions.

It is important to remember that moving to EAFm will be incremental. So rather than worrying about identifying the perfect scale, a better approach is often to take ecosystem considerations into account at a scale that is most appropriate for the fishery in question. This may mean starting with a focus on a waterbody or stock of a particular fishery

(harvest and bycatch) and the economy and culture of the communities who access that particular fishery.

For the highest likelihood of success, an EAFm plan should be developed pragmatically, and should be based on practical scales and boundaries, taking into account existing jurisdictional boundaries. This means that the stock or fishery under consideration should also be framed within meaningful jurisdictional boundaries (e.g. state or provincial jurisdictions). Crossing between jurisdictional boundaries can be a challenge, but EAFm does provide a framework within which cooperation or harmonization can occur (see [Module 8 Startup A task v](#) and [Module 16 Reality Check II](#)).

**Activity:** In many countries, fisheries management has been devolved to the district or municipality level. In your groups, answer the question: “Is the district or municipality the correct scale to manage all fisheries?”

## INCREASED PARTICIPATION

In EAFm both the local resource users and the government (whether local, provincial, national or regional) share the responsibility and authority for co-management and determining the sustainability goals of the fishery. EAFm is participatory and this means stakeholders are a central part of the co-management process.

For more details on participation see [Module 9 Startup B](#) and the [People Toolkit](#).

Stakeholders ☺ and resource users include people, households and communities who interact with and care about/depend upon the fishery and the associated ecosystem. This will include a diverse number of users, for instance fishers, tour operators, coastal developers, shipping industry, conservationists, etc.

### Does including more people in the fishery management process increase conflict?

In some cases, stakeholders are competitors and their inclusion can be challenging, especially if a pre-existing conflict exists (this can be between resource users or between institutions, e.g. the environment and fisheries departments).

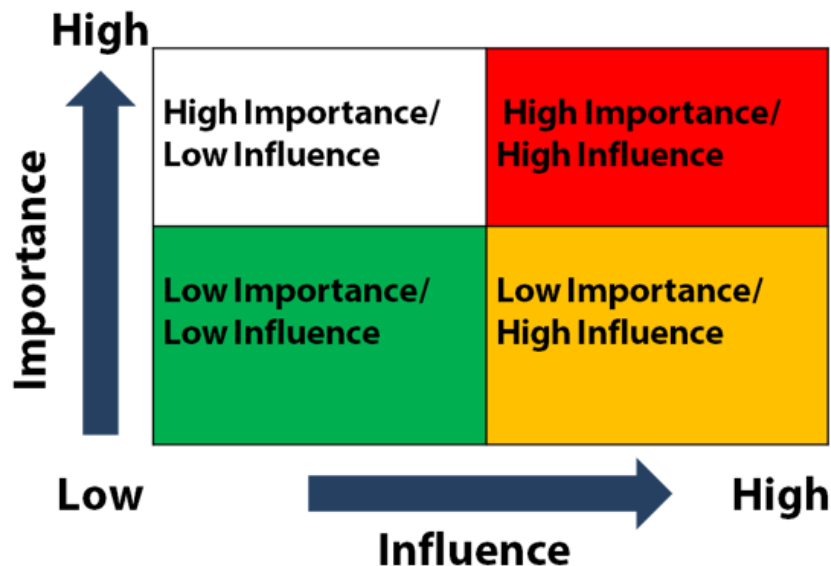
In the long-run, having diverse user perspectives represented and involved in the management planning process serves to increase the understanding of issues and can help to reconcile differences (rather than the alternative which is to become entrenched in one’s own opinion or that of a single institution). EAFm includes decision-making protocols that can pre-empt and deal with conflict and there are a number of tools to do so (see [Module 12 Reality Check I](#) and the [People Toolkit](#)).

Stakeholders are identified in [Module 8 Startup A](#) phase of the EAFm planning process and a Key Stakeholder Group is established to represent these different voices. Stakeholder representatives in the key stakeholder group communicate the needs of those whom they represent, into the EAFm plan. These needs will help shape the goals and objectives of the EAFm plan and this will usually involve a trade-off between social,

economic and ecological objectives (see [Module 3 Fisheries management and the ecosystem approach](#)).

Power relations, influence and ability to make decisions will vary considerably between the different stakeholders (Figure 4.3).

**Figure 4.3:** Matrix for assessing stakeholder importance and influence



Potential stakeholders include: fishers and fisher associations, water users (irrigation/agriculture/hydropower) governments (district – national), fishery related (e.g. boat owners, money lenders), compliance and enforcement, other users (e.g. tourism,) and external agents (e.g. NGOs, researchers) (Figure 4.4).

A co-management approach is more likely to foster stakeholder participation. As we have learned, co-management is a partnership arrangement between stakeholders and governments to share the responsibility and authority for the management of a fishery, with various degrees of power sharing. More details on co-management can be found in [Module 9 Startup B](#) and [Module 16 Reality Check II](#).

### MULTIPLE OBJECTIVES

The success of EAFm depends on reaching a balance between conservation and the sustainable use of fishery resources within the limits of ecosystem functioning (see your [case-study example](#)) and between ecological, economic and social objectives within specific geographical areas. EAFm requires commitment to overcome difficulties (both conceptual and practical) in making choices that require trade-offs and compromises between different sectors of society. This requires long-term political support (backed by sufficient resources) as well as short-term economic and social support, particularly for local stakeholders. However, as noted previously, if successful the benefits can be significant.

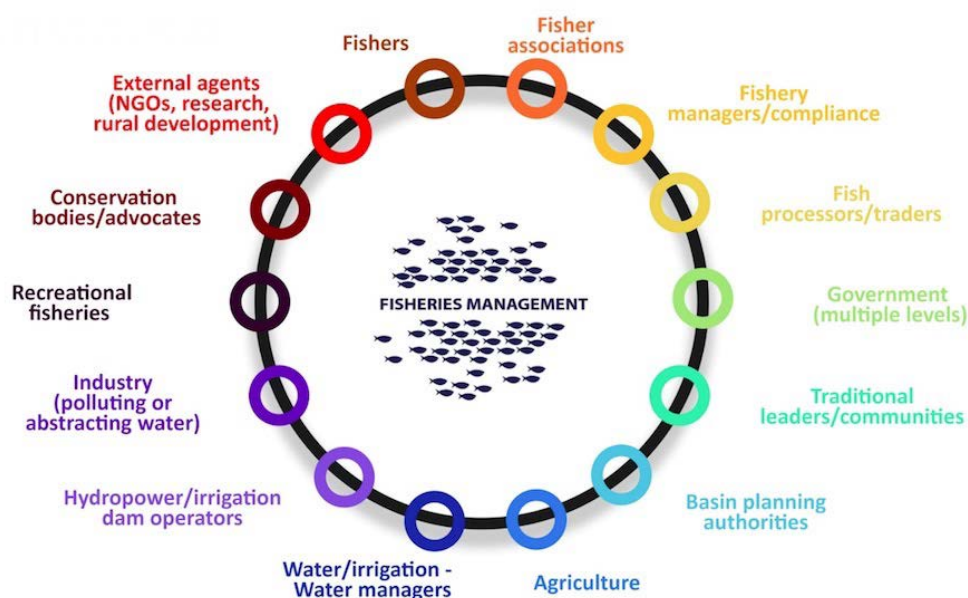
## COOPERATION AND COORDINATION

With EAFm there is a need to ensure harmony between the different scales of governance and management, and linkages between and among the various scales, particularly governance scales that likely range from individual communities to districts, provinces and national governments.

The scaling of governance (i.e. legal and jurisdictional considerations) ties in closely with the need for institutional cooperation and coordination (see [Module 8 Startup A Task v](#) and [Module 16 Reality Check II](#)). This is because, to be able to move beyond what fisheries agencies typically try to do (i.e. manage fisheries in lots of different places) towards what EAFm does (manage different fishing and non-fishing activities, and sectors affecting fisheries and associated ecosystems in one place), other non-fishery sectors need to be engaged and involved in the co-management process.

EAFm requires institutional cooperation and coordination because it more explicitly deals with the interactions of the fishery sector with other sectors (Figure 4.4).

**Figure 4.4:** Potential EAFm stakeholders and the linkages in cooperation and coordination



Before connections are made with other sectors, it is important to make sure that internal institutional cooperation is in good order. For instance, what are the information requirements for fisheries science and research for supporting fisheries management? The next step is to ensure effective institutional cooperation and coordination between sectors that are directly related and sometimes even mandated with fishery-associated activities.

For example, do monitoring and research activities within academic institutions reflect fisheries related management requirements? Or, is the fishery agency coordinating with other agencies over control and enforcement issues?

Once better cooperation within fisheries agencies and sectors more directly related to fishing activities has been achieved then fisheries agencies will be better positioned to coordinate with less obviously related sectors. This may involve working with sectors not traditionally associated with fisheries. For example, ministries of agriculture, energy, tourism, housing and development, women's affairs, the environment and rural water sanitation. Through better cooperation, these different actors can actively contribute and work together on fisheries co-management and share the costs, benefits, successes and failures. Cooperation is needed for actions relating to rule making, conflict management, power sharing, social learning, dialogue and communication as well as development among the partners.

Examples of cooperative or coordinating activities or mechanisms include:

- talking to others;
- data sharing and information;
- support for local/provincial implementation;
- harmonized or complementary work plans, budgets (across sectors/agencies) and goals;
- linking in with other coordination arrangements e.g. IWRM; and
- developing interagency arrangements (e.g. water allocation agreements, minimum dry season flows from dams, abstraction from rivers)

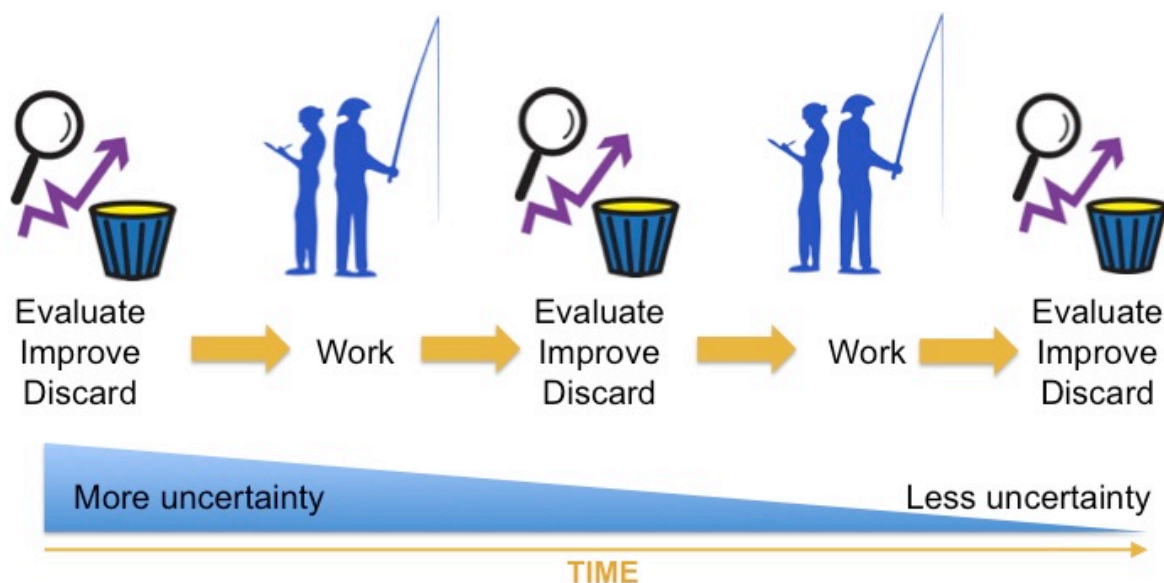
In developing interagency arrangements, formalized memorandums of understanding (MOUs) or other binding agreements can help to establish cross-sector collaboration.

### **ADAPTIVE MANAGEMENT**

Adaptive management provides a framework for managing change over time (see temporal scaling issues above) by learning from doing. Adaptive management involves managing and learning from what has been done by evaluating the outcome of the management action. It is closely linked to the precautionary approach (see section below) (Figure 4.5).

It is not necessary to wait until all the data and information are available and analysed before taking action. Management actions can be put in place and providing they are monitored and evaluated, they can be modified based on lessons learned during implementation.

**Figure 4.5:** Adaptive management aims to reduce uncertainty through time by evaluating the efficacy of what has been done in order to retain management interventions that work and discard or improve those that do not.



### PRECAUTIONARY APPROACH

The precautionary approach can be considered to be the backbone of EAFm. It was originally defined by UNCED in 1992 as:

*“... where there are threats of serious or irreversible damage, lack of full scientific certainty shall not be used as a reason for postponing cost-effective measures to prevent environmental degradation”*

The United Nations Conference on Straddling Fish Stocks and Highly Migratory Fish Stocks (UN 1995) first articulated the principle for fisheries with the following definition:

*“States shall be more cautious when information is uncertain, unreliable or inadequate. The absence of adequate scientific information shall not be used as a reason for postponing or failing to take conservation and management measures” (UN, 1995).*

The two ramifications of the precautionary approach, therefore, are:

#### **Lack of data and information should not be used as an excuse for not taking action.**

A claim of insufficient information is often used as a delaying tactic. Instead of dealing with an obvious environmental problem, the cry of “we need more research/data” is used to focus the issue back on the scientific community, rather than starting to deal with it using an adaptive management approach. A common myth is that the scientific information available is insufficient to apply EAFm to any ecosystem, let alone ecosystems that are poorly studied. However, EAFm is **not** about managing the whole ecosystem; it is about integrating management – at a minimum it means managing direct human impacts of fisheries (and other human activities).

In fact, there is often enough information to begin taking action, otherwise the issue would not have been recognized in the first place.

**Where there is uncertainty, management actions should be less risky.**

The greater the information gap and the amount of uncertainty, the more risk averse management actions should be. If, through adaptive management, the learning is that the situation is worse than that originally described, risk-averse management allows room for later correction.

**Activity:** In groups, revisit threats and issues and cluster them into three EAFm components.

**Activity:** Working individually, think which, if any, of the 7 EAFm principles are already being applied in your fishery, and to what extent?

Share your thoughts in small groups.



## **MODULE 5: MOVING TOWARDS EAFm**

### **SESSION OBJECTIVES:**

- Recognize how other countries have adopted EAFm approaches and principles and moved towards EAFm (case study - linking fisheries, environment and socio-economic considerations)
- Determine your country progress towards EAFm
- Identify your country challenges to achieving this

## CASE STUDIES

Volume 2 of the training course contains presentations of five example case studies describing different inland fisheries situations and EAFm. One case study which is relevant to the trainees own situation should be selected for discussion during the EAFm course.

Each case study follows a similar format and is intended to outline the key elements that relate to EAFm.

Section	Covered in the presentation
<i>Overview</i>	Why the case study is relevant to EAFm and what the case study illustrates
<i>Introduction</i>	A short description of the location and key features of the inland fishery which is used for the case study
<i>Ecological well-being</i>	
<i>Ecology</i>	The environment and ecology and function of the system which supports the inland fishery.
<i>Fisheries</i>	Major features related to the fish resources and how the fishery is managed
<i>Human Well Being</i>	
<i>Economic contribution</i>	The value of the fishery locally and its national economic contribution.
<i>Employment/ Livelihoods</i>	Role of the fishery in livelihoods, people employed as well as human-related problems (e.g. poverty, conflict etc.)
<i>Inland Fishery Timeline</i>	Timeline of development in the fishery, showing key events/milestones that have influenced it.
<i>Good Governance</i>	How the fishery is managed. Other governance issues that relate to the fishery and its management
<i>Alignment with EAFm principles</i>	Summary of how current policies, management and human activities related to the fishery are aligned to the 7 principles of EAFm
<i>Capacity/ delivery issues</i>	Other issues related to the capacity to deliver or sustain the EAFm related features.

Summaries of the five case studies are found below.

## **LAKE VICTORIA - STRENGTHENING THE INTEGRATION OF FISHERIES MANAGEMENT AND ENVIRONMENTAL PROGRAMS**

This module demonstrates how, over the past several decades, the national governments of Uganda, Kenya and Tanzania, have been evolving from conventional fisheries management towards EAFm. The module discusses how fisheries management laws and policies have moved steadily toward EAFm and how the seven EAFm principles are increasingly being adopted into the Lake's fisheries management. The scope for the closer integration of fisheries and environmental programs is discussed.

## **LAKE MALAWI/MALOMBE, MALAWI - IMPROVING APPROACHES TO FISHERIES CO MANAGEMENT**

This module describes Malawi's shift towards increasing community participation in fisheries co-management of Lake Malawi and Lake Malombe and the challenges faced. Results to date have been mixed and key institutional linkages remain weak. The module suggests how a move towards EAFm offers a way to improve the governance of these fisheries and help secure environmental services and biodiversity, as well as benefitting the livelihoods of fishers in Malawi's lakeside communities

## **CAMBODIA - STRENGTHENING FLOODPLAIN AND RICEFIELD FISHERIES CO-MANAGEMENT**

This module describes the emergence of community fisheries co-management in Cambodia, following the abolition of the fishing lot system beginning in 1999. The benefits of these policies and some drawbacks, including the continued open access nature of the fisheries, are discussed. Opportunities for strengthening the co-management movement in Cambodia through a closer alignment to EAFm principles are discussed.

## **AYEYARWADDY, MYANMAR - STRENGTHENING PRO-POOR FISHERIES GOVERNANCE REFORMS**

The history of freshwater fisheries governance in Myanmar from the colonial period onwards consistently focused on revenue generation resulting in a gradual reduction in small-scale fisher access to their traditional fishing grounds. This has increasingly encouraged higher rates of exploitation and resulted in natural resource degradation and declining fisheries production. It has also resulted in social issues, with the most significant problems associated with stakeholder inequality, resource decline, and poverty. In recent years these issues have triggered demands from small-scale farmers for more equitable sharing and sustainable resources co-management. Since 2012, freshwater fishery governance has steadily improved through structural changes and interactive processes. New laws and pro-poor policies have been introduced in several states and regions, and small-scale access to fishing grounds has generally improved. The module proposes that the integration of EAFm into transitional processes could strengthen community co-management capacity and provide a means for fisheries officers to engage more effectively with community fisher organisations.

## PANTANAL REGION BRAZIL - CHANGING FOOD FISHERIES TO RECREATION

The Pantanal in the Upper Paraguay river basin is the world's largest continuous wetland covering around 140 000 km<sup>2</sup> (3% of the world's wetlands). It is situated mainly in the two Brazilian states Mato Grosso and Mato Grosso do Sul with some small pockets in the neighbouring countries Bolivia (10-15%) and Paraguay (5-10%). This case study demonstrates how policies promoting tourism have converted the fisheries of the Pantanal from a for food fishery towards a recreational fishery and highlights the impacts on the fisheries and the riparian population. It further explores how external pressures are affecting the ecosystem and the fisheries and how the governments of the riparian states are dealing with these.

**Question:** What key lessons for your country situation can you draw from the selected case study?

**Activity:** Review EAFm continuum for an individual fishery and plot for local or country fishery.

**Activity:** Identify challenges and opportunities for your country in moving towards EAFm.

## **MODULE 6: EAFm PLANS – THE LINK BETWEEN POLICY AND ACTION**

### **SESSION OBJECTIVE:**

- Recognize the need for effective planning;
- Explain how to translate policies into actions.

## OVERVIEW

This module explains how effective plans are the link between policy and implementation. It outlines the adaptive EAFm cycle of planning, doing, checking and improving, and clarifies what good planning entails for EAFm.

## INTRODUCTION

Many countries have national policies or frameworks that support EAFm principles, but there are few operational plans that actually enable fishery agencies to manage through EAFm. To have operational plans, there needs to be an increase in the *planning capacity* for fisheries. This involves creating awareness about the need for planning, and then having the skills to carry out the planning in a participatory way (refer to [Module 9 Startup B](#) and [Module 12 Reality Check I](#)).

## WHY PLAN?

Good management needs good planning. Plans are needed to implement policies, as policies on their own seldom result in action, and plans are needed to link policies to action.

EAFm planning encourages participatory input from key stakeholders who through their participation will gain ownership of the plan and this will facilitate better implementation. Planning should be participatory as it provides an opportunity to consider the future from different perspectives and what outcomes are desirable by the people who can affect or will be affected by the plan, as well as producing a plan that can be used to chart progress. In many cases, the process of participation can be as important as the final product, especially for those impacted socially and economically by the process.

It is helpful to start the planning process by developing a planning work plan (who does what and by when in the planning process). This is presented in more detail in [Module 8 Startup A task ii](#).

Planning can facilitate resource mobilization that allows judicious allocation of scarce resources within an organization, such that they have the greatest likelihood of achieving the goals. A good plan can attract funding either through internal budgetary processes or from outside donors.

It can also promote resource use efficiency as planning provides more certainty for the roles and responsibilities of the different players. This is especially important in an ecosystem approach involving players that come from different sectors, disciplines and backgrounds.

## THE MANAGEMENT CYCLE

The management of any activity involves three important stages (i) planning; (ii) doing; and (iii) checking and improving (Figure 6.1).

During the *planning* stage, stakeholder consultations are used to determine what is to be achieved by management and how success will be measured. In the jargon of management plans this involves agreeing objectives, management actions and

performance measures, as well as indicators ☺ , targets and baseline ☺ for monitoring progress, and for identifying whether adjustments are required (see [Modules 13 and 14](#)).

In the *doing or implementing* stage, managers facilitate the implementation of the action plan(s).

In the *checking and improving* stage, management reviews performance information to determine if the actions are achieving the desired result and makes adjustments to reflect learning from experience (adaptive management) – see [Module 17 Steps 5.1-5.2](#)). The planning stage should set up how this is going to be achieved.

**Figure 6.1:** The EAFm cycle is based on the three phases of adaptive management.



## FROM PRINCIPLES TO IMPLEMENTATION

The key to EAFm is to “translate” the high level guiding principles, such as those in the FAO Code of Conduct for Responsible Fisheries (or their related international instruments) into objectives and actions that can be implemented in a given fishery. As the policies are all founded on the concept of sustainable development, any actions instigated through planning, by definition assist in implementing sustainable development through EAFm. See Figure 6.2 below.



**Figure 6.2:** Steps in moving from principles to action



### FROM PRINCIPLES TO POLICY GOALS

Translation starts with converting high level guiding principles into policy goals. Many of the valuable principles underpinning EAFm are so generic that they cannot really be achieved in a practical sense. Furthermore, many of the characteristics of ecosystems, such as ecosystem health, integrity, and resilience are difficult to quantify concepts that may not be fully understood and may be difficult to apply in practice. These principles are often incorporated in the higher-level policy goals, such as conserving biodiversity, maintaining fishery habitats, protecting important food chain functions and so on, which often form the basis of national policies and plans.

### FROM POLICY GOALS TO ISSUES AND MANAGEMENT OBJECTIVES

The higher-level policy goals then need to be broken down into more specific management objectives. This is achieved by identifying and prioritizing issues and then developing a management objective for each issue. ([Module 7 EAFm Process Overview](#) and [Module 13 Step 3.1](#)). At the operational level, priorities can be set through a risk assessment process and trade-offs and balances reached through consensus. These objectives need to be specific enough that one or other management action can address them and the success (or otherwise) of this intervention can be monitored and assessed.

### FROM OBJECTIVES TO MANAGEMENT ACTIONS

Each management objective can be achieved by the implementation of a management action (e.g. introducing a limit on the number of fishing vessels, increasing the mesh size of nets, re-afforestation of watersheds, etc.). Often, one management action can address several objectives.

Provided there is a good linkage between the high-level policy goals and the management objectives, management actions in the EAFm plan can be used to implement policy.

## GOOD PLANNING

- **Make general principles and higher level goals operational:** for effective EAFm, the general principles and the higher-level policy goals need to be translated into management objectives. An operational objective is an objective that management can address. For example, “Promote sustainable development of the fishery” cannot be addressed directly by management, but an operational objective of “Reduce the number of fishing nets” can be addressed by a management measure.
- **Provide direction:** planning provides a clear sense of direction for the activities of management. It strengthens the confidence of the stakeholders and encourages them to move along a chosen path, while also clarifying the actions they should take to achieve the goals.
- **Consider alternative courses of action:** planning permits managers to examine and analyse alternative courses of action with a better understanding of their likely consequences.
- **Reduce uncertainties:** planning forces managers and stakeholders to look beyond immediate concerns. It encourages them to analyse the complexities and uncertainties of the environment and attempt to gain control.
- **Minimize impulsive and arbitrary decisions:** planning tends to minimize the incidence of impulsive and arbitrary decisions and *ad hoc* actions. It reduces the probability of major errors and failures in managerial actions. It injects a measure of discipline into thinking and action.
- **Provide a basis for better management:** planning provides the basis for the other managerial functions. Thus, planning is the central function around which other functions (e.g. monitoring, control and surveillance (MCS)) are designed.
- **Include adaptive responses:** planning tends to improve the ability of management to adapt effectively and adjust its activities and directions in response to the changes taking place in the external environment.
- **Enable proactive action:** while adaptation is undertaken in reaction and response to some changes in the outside world, it is not sufficient in some situations. In recognition of this fact, planning stimulates management to decide in advance on what action to take when things do not go according to plan (control rules).
- **Promote transparency:** makes decision making transparent and available to all stakeholders.

## OUTPUTS FROM PLANNING

Planning can be done at many different levels and geographic scales, but it is important that plans align with each other and can comfortably be nested under each other (Figure 6.3).

**Figure 6.3:** Nested plans - EAFm in inland fisheries often lies within other planning frameworks



In EAFm a typical set of nested plans and reports would be:

- A national 5-year plan;
- an agency strategic plan: a plan that includes the higher policy goals derived from the principles of responsible fisheries;
- an EAFm plan: the outcome of the planning process that contains objectives, management actions and performance measures (targets and indicators );
- work plans: these are an outline of all tasks that need to be completed (including timelines and responsibilities) in order to implement the EAFm plan.

## **MODULE 7: EAFm PROCESS OVERVIEW**

### **SESSION OBJECTIVES:**

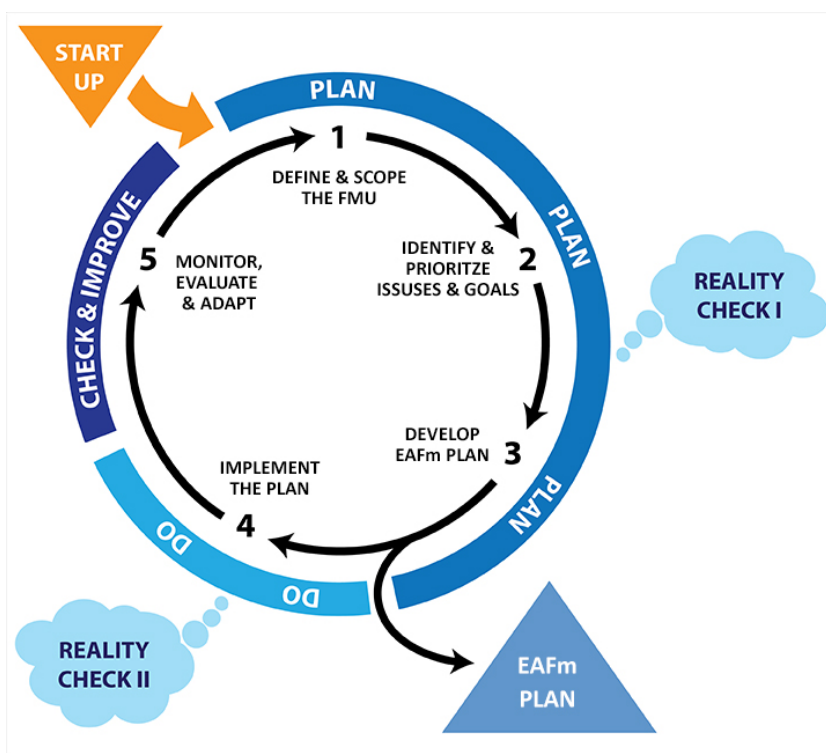
- Describe the key steps of the EAFm process and how to plan, implement and monitor EAFm;
- Identify the planning steps in the EAFm process;
- Describe the outline of an EAFm plan.

## OVERVIEW

This module outlines the EAFm process. It describes the initial tasks and the five EAFm steps and sub-steps, highlighting those that specifically involve planning.



As explained earlier, the EAFm cycle consists of three main stages: *planning, doing, checking and improving*. These three stages translate into five major steps for EAFm, as outlined in Figure 7.1 and the Table 7.1 below. In the table, the planning steps are shaded in grey.

**Figure 7.1:** The 5 steps of EAFm



**Table 7.1:** Summary of the five EAFm steps

STEP	MAIN FOCUS	SUB-STEPS
<b>Startup</b>	<b>Start-up</b>	A: Prepare the ground B: Engage stakeholders
<b>STEP 1</b>	<b>Define and scope the Fisheries Management Unit (FMU)</b>	1.1 Define the FMU 1.2 Agree the FMU vision 1.3 Scope and profile the FMU
<b>STEP 2</b>	<b>Identify and prioritize issues and goals</b>	2.1 Identify threats and issues

STEP	MAIN FOCUS	SUB-STEPS
		2.2 Prioritize threats and issues 2.3 Define goals for EAFm plan Reality Check I 
<b>STEP 3</b>	<b>Develop the EAFm plan</b>	3.1 Develop management objectives 3.2 Develop indicators 3.3 Agree on management actions and compliance 3.4 Identify finance 3.5 Finalize EAFm plan
<b>STEP 4</b>	<b>Implement the plan</b>	4.1 Formalize, communicate and engage Reality Check II 
<b>STEP 5</b>	<b>Monitor, evaluate and adapt</b>	5.1 Monitor and evaluate performance of management actions 5.2 Review and adapt the plan

## STARTUP A AND B

Before starting Step 1 of the process, a number of startup tasks are required. These consist of

- one-off tasks in **Module 8 Startup A** - Preparing the ground;
- and a series of on-going processes initiated in **Module 9 Startup B** - Engaging stakeholders.

Tasks in Startup A - Preparing the ground consist of:

- Identifying the EAFm team and facilitators ☺
- Identifying the broad FMU area;
- Developing a startup work plan;
- An EAFm introduction;
- Coordinate with other agencies and government levels;
- Identifying stakeholders and organizations;
- Establishing key stakeholder group;
- Determining the legal basis for EAFm

Startup B - Engaging stakeholders is a critical stage that involves identifying potential stakeholders, assessing their influence and importance; raising awareness about the

EAFm process and starting the on-going process of involving them in the EAFm process stages (initially planning, and later in implementation and monitoring). Preliminary stakeholder engagement is important for identifying the expectations, roles and responsibilities of stakeholders.

## OUTLINE OF THE FIVE EAFM STEPS

### STEP 1 – DEFINE AND SCOPE THE FISHERY MANAGEMENT UNIT

- 1.1 Define the Fisheries Management Unit (FMU): The identified FMU will most likely be based on a geographical area and ideally will coincide with a clearly and precisely defined ecosystem. However, ecosystems are not always clearly defined entities with unambiguous boundaries and they may cross or be contained within existing fishery management areas. The final choice of FMU and geographic area for a management plan will depend on a number of factors, but at the very least it should cover all harvesting sub-sectors, both small-scale artisanal and large-scale commercial fishing.
- 1.2 Agree the FMU vision: At the outset, it is very useful for all stakeholders to agree on a vision for the EAFm plan. A vision is a long-term statement of the aspirations of the stakeholders.
- 1.3 Scope the FMU: This refers to the collection and collation of background information (fish, gears, people, etc.) that characterizes the FMU. Ensure you have information relating to economic, social, environmental and governance factors. You may need to collect quantitative and qualitative data (remember some of this data may already exist, not necessarily in your agency but may be available in partner agencies or departments).

### STEP 2 – IDENTIFY AND PRIORITIZE ISSUES AND GOALS

- 2.1 Identify threats and issues: The next step is for stakeholders to undertake an initial evaluation of the threats and issues associated with the fishery. These must include issues for each of the three components (ecological well-being; human well-being; and governance). Broad issues should be divided into several specific issues that can be tackled through a management intervention of some kind.
- 2.2 Prioritize these issues: It is likely that a large number of issues will be raised and these will need to be prioritized so that a manageable number of issues are identified for addressing through the EAFm plan. Risk assessment tools are available to help you prioritize the identified issues, so as to define which issues are of the highest priority and therefore need to be managed directly.
- 2.3 Define goals for the EAFm plan: While considering the issues it is useful to group them into separate themes (e.g. those to do with fishing, those to do with communities etc). Then develop a goal for each theme. These are also long-term goals that relate to the overall vision.





## REALITY CHECK I

Consider constraints to and opportunities for achieving goals: This is a reality check to decide whether the goals are really achievable.

### STEP 3 – DEVELOP THE EAFM PLAN

- 3.1 Develop management objectives: Clear and appropriate management objectives are required for all high priority issues requiring management. The objectives need to state what will be achieved. Management objectives are by definition objectives that can be addressed by management actions.
- 3.2 Targets and Indicators: Develop targets and indicators for the above objectives. These will enable stakeholders to assess whether the objectives are being achieved.
- 3.3 Agree on management actions and compliance: Discuss the management actions needed to meet each specific objective. Often the same action can meet several objectives. Management actions should be accompanied with a description of how the actions will be complied with, by including actions to enforce and generate compliance. Collectively, the objectives, targets, indicators and management actions, provide a means to communicate with decision-makers on how well management is performing and will influence future changes in management.

If possible, specific management actions should also be accompanied by decision rules on how they are to be applied and what to do if they are not working. The key is to try and agree about what might happen and how to counteract this before it happens.

- 3.4 Identify sustainable financing to support implementation of the plan.
- 3.5 Finalise the EAFm plan: This is achieved by systematically collating the key data from the above steps (see template below plus a few more considerations). This plan will guide you during the EAFm process. It is not set in stone and should be adapted as new information emerges and lessons are learned.

### STEP 4 – IMPLEMENT THE PLAN

- 4.1 Formalize, communicate and engage. A simple work plan is developed that outlines who does what tasks during implementation, and by when. The EAFm plan needs to be formalized so that it has authority and backing. A communication strategy needs to be developed to communicate different types of information to different stakeholders. The initial stakeholder engagement develops into a process of continuous engagement with stakeholders to ensure that the EAFm plan can be carried out.



The appropriate governance arrangements will need to be clearly defined. The implementation of EAFm can utilize co-management arrangements, whereby stakeholders (or partners in the power sharing arrangement) actively contribute and work together to implement fisheries management. In some cases, a supporting policy environment will need to be established for co-management arrangements to work. This will take time and probably require strengthening institutions and developing human capacity.

### STEP 5 – MONITOR, EVALUATE AND ADAPT

- 5.1 Monitor and evaluate performance of management actions: A set of targets and indicators were identified in the EAFm plan. Monitoring these and any other generic indicators allows management to see if the plan is on track and to take remedial action if necessary, i.e. adaptive management. The indicator information is collated and reviewed periodically to assess whether the management actions are actually attaining the objectives as planned
- 5.2 Review and adapt the plan. . Monitoring data can be collated yearly for a quick check on progress and the plan can be adapted if there is sufficient evidence to indicate that a change is necessary. Every three to five years a longer-term review should take place to assess how the EAFm plan is performing. The actual time of the review should reflect the nested nature of the EAFm plan, such that the outputs and reports can feed into the broader strategic plans. In the light of longer-term data and reviews, the plan may need to be adapted considerably to allow for unforeseen elements and to incorporate lessons learned.

**Activity:** Human circle to embed the EAFm steps.

**Activity:** Form meaningful (FMU) groups.

## EAFm TEMPLATE

This is the suggested template for the EAFm plan. The outputs from Steps 1-3 are essential components of the plan, and elements from Steps 4-5 also need to be included. The template consists of 10 headings and sub-headings.

<b>EAFm PLAN FOR FMU [NAME]</b>
<b>1. VISION</b>
The broad goal of stakeholders including management.
<b>2. BACKGROUND</b>
Description of the area and resources to be managed, including maps at different scales.
<b>The fisheries management area:</b>
Area of operation of the fishery, jurisdictions and ecosystem "boundaries" (including national/province/district jurisdictions).
<ul style="list-style-type: none"> <li>Map of FMU.</li> </ul>
<b>History of fishing and management:</b>
<ul style="list-style-type: none"> <li>Brief description of the past development of the fishery in terms of fishing gear, targeted species, people involved, etc.</li> </ul>
<b>Current status of the fishery :</b>
<ul style="list-style-type: none"> <li>Description of the fishery resources and gears used;</li> <li>Resource status;</li> <li>Map of resource use patterns.</li> </ul>
<b>Current management (co-management) arrangements:</b>
<ul style="list-style-type: none"> <li>Existing co management arrangements</li> </ul>
<b>Socio-economic benefits, including postharvest:</b>
<ul style="list-style-type: none"> <li>Description of stakeholders and their interests (including socio-economic status);</li> <li>Description of other uses/users of the ecosystem, especially activities that could have major impacts and arrangements for coordination and consultation processes;</li> <li>Social and economic benefits, both now and in the future.</li> </ul>
<b>Special environmental considerations:</b>
<ul style="list-style-type: none"> <li>Details of critical environments, particularly sensitive areas and endangered species.</li> </ul>
<b>Institutional aspects:</b>
<ul style="list-style-type: none"> <li>Legislative background;</li> <li>Existing co-management arrangements – roles and responsibilities;</li> <li>MCS arrangements;</li> <li>Consultation process leading to the plan and on-going activities;</li> <li>Details of decision-making process, including recognized participants;</li> <li>Nature of rights granted in the fishery and details of those holding the rights;</li> </ul>

- Maps of management interventions/user rights/jurisdiction boundaries.

### 3. MAJOR THREATS AND ISSUES

#### Ecological issues:

- Fisheries resources and general environmental issues, including both the impact of the fishery on the environment and vice versa.
- Water access and use issues. Competing demands for freshwater- irrigation, industry, urban water supply

#### Social and economic issues:

- Issues relating to the people involved in fishing, the general public and at the national level, including gender issues.

#### Governance issues:

- Issues affecting the ability to achieve the management objectives.
- Conflicting sectoral governance objectives (e.g. reservoir fisheries v irrigation)

### 4. GOALS OF MANAGEMENT

Goals for each component (for different sets of issues)

### 5. OBJECTIVES, TARGETS AND INDICATORS

Priority issues, objectives and targets for the fishery, covering:

- fishery resources;
- environment (including bycatch, habitats, prey protection, biodiversity, etc.);
- social;
- economic;
- governance (ability to achieve the plan).

### 6. MANAGEMENT ACTIONS

Agreed actions for the plan to meet all objectives within an agreed time frame, including, habitat protection, socio-economic benefits, good governance, etc.

Water-use agreements/agreements made with other departments or ministries.

### 7. COMPLIANCE

For actions that require rules/regulations – arrangements for ensuring that the management actions are effective.

Also those actions that others are supposed to implement

### 8. DATA AND INFORMATION NEEDS

Data and information needs to monitor implementation of the plan. Clarify where the data are to be found and who collects, analyses and uses the information.

### 9. FINANCING

Major sources of funding.

### 10. REVIEW OF THE PLAN

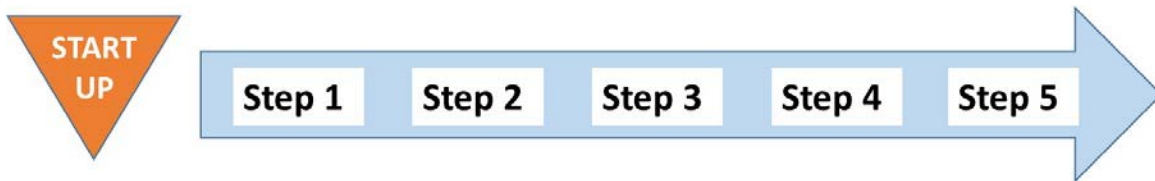
Date and nature of next review(s) and audit of performance of management.

## **MODULE 8: STARTUP A – PREPARING FOR EAFm**

### **SESSION OBJECTIVES:**

Define startup tasks needed to initiate the EAFm process and co-management, including:

- Define Startup tasks needed to initiate the EAFm process and co-management;
- Learn how to identify and prioritize stakeholders.



## OVERVIEW

This module details the eight Startup tasks that need to be carried out to initiate the EAFm process.

## INTRODUCTION

There are eight Startup tasks to get the EAFm process moving; each of these can be revisited or undertaken in more depth later in the EAFm planning process. These Startup tasks are undertaken initially by the promoting agency 😊 but later they may be directed by the EAFm team and facilitators. Engaging stakeholders is highlighted in Startup B and is used throughout the process of EAFm.

For many of these tasks and later steps, it is necessary to hold participatory workshops or meetings. The next module, [Module 9 Startup B](#) explains how to do this.

EAFm planning should not proceed until there is sufficient support from stakeholders and the scope of the exercise is understood. However, a perceived lack of information should not be used as an excuse to delay initiation, because EAFm deals with such situations by adopting the precautionary approach.

## A: STARTUP TASKS

### TASK I. IDENTIFY THE EAFM TEAM AND FACILITATORS

The promoting agency for EAFm should typically be the fisheries agency (at the appropriate level). This agency needs to establish a team to guide the EAFm planning process. Good facilitation and the skills of community mobilization and conflict management will be key for this team as they consult with stakeholders during the EAFm process. They will need to be sure that they facilitate fair representation of all stakeholder groups, creating a transparent and fair decision-making environment and clear two-way communication of information.

### TASK II. IDENTIFY THE BROAD AREA TO BE MANAGED

Taking into account the scaling issues identified earlier ([Module 4 Principles of EAFm](#)) the EAFm team should agree on what it is they are managing. This will be defined more formally later on in the process but at this Startup stage all should agree roughly on the area, taking into account existing jurisdictional boundaries. This area defines, to some extent, who the relevant stakeholders will be (see task vi. later).

### TASK III. DEVELOP STARTUP WORK PLAN

The EAFm team initially needs to identify the broad goals of the planning exercise, strategies and next steps to help clarify and identify the EAFm partners and stakeholders and their initial roles and responsibilities in the planning process. At this early stage it is also important to consider the size of the budget available. This task differs from actually

developing an EAFm plan that contains specific management goals, objectives and actions to be undertaken in EAFm Step 3.

In many countries, the process will involve working with, or through, traditional community leaders or institutions, while still allowing plenty of opportunities for other community groups to participate. Cultural and social context will be important considerations in working with stakeholders in all places and at all scales; at the national scale, for example, the primary facilitators may wish to consider how to engage and facilitate, given the particular cultural and institutional context of the various sectors that will be engaged in the planning process.

A Startup work plan outlines a set of activities to be undertaken during the preparation phases of EAFm (e.g. stakeholder meetings), the sequence of activities, and the individual responsibilities for each activity. The work plan should set forth as precisely as possible the Startup activities that will be undertaken, by whom, by what date, and under what budget.

Part of the Startup work plan will be identifying short-term sources of funding to initiate the planning process. Is there sufficient funding to carry out the Startup work plan and subsequent planning? Ideally, this should come from existing budgets, but because these activities may not have been specifically identified, changes to the budget may be needed. All options for extra funding, including consideration of the team putting in their time “in kind” as part of the existing job/occupation need to be included. In some cases, starting EAFm will be part of a donor-supported project and every opportunity should be taken to direct sufficient funds to the planned activities. Many aid projects will have budgets for these types of activities if it is within their mandate.

#### **TASK IV. EAFM INTRODUCTION**

The EAFm team should begin making courtesy calls, holding meetings and raising public awareness to establish the initial working relationship between the community, the prospective agency partners, and the facilitator or agency. This entails a number of activities, including:

- formally introducing EAFm to prospective partners;
- answering questions about EAFm;
- establishing rapport with prospective partners;
- identifying roles of partners;
- organizing and attending meetings, training and awareness-raising sessions;
- collecting baseline data and information on the management unit;
- meeting with local leaders, government officials, etc. and obtaining approvals; and
- initiating the EAFm process with the community, government agency partners, and other stakeholders.

#### **TASK V. COORDINATE WITH OTHER AGENCIES AND LEVELS OF GOVERNMENT**

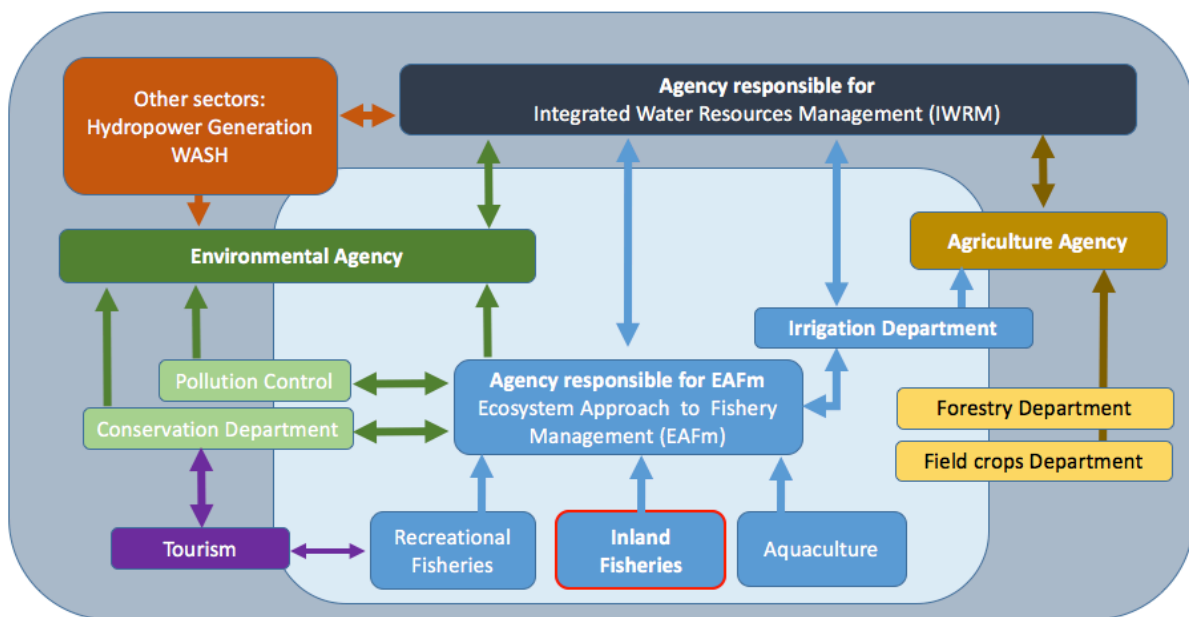
EAFm requires coordination, consultation, cooperation and joint decision-making, not only between different fisheries operating in the same ecosystem or geographical area, but also between the fisheries management agency and the other sectors that have an impact on fisheries or are affected by fisheries



EAFm typically sits within broader water management frameworks (Figure 8.1). These may be coordinated as part of IWRM or be less coherent and relate more individually to other sectors. It is essential to understand these linkages and where decision-making powers reside. This will determine the extent to which an EAFm can support negotiation and help advocate for (mitigating) actions to be taken by other sectors.

It is important to ensure that fisheries institutions and water and environmental management agencies at each level of government (from local, municipal, district, provincial, regional to national) are informed and engaged early on in the EAFm planning process. This helps to harmonize policies and objectives across different levels of governance, as well as in situations of overlapping or mismatched jurisdiction (e.g. where several agencies have management authority over different parts of a fish species' lifecycle). It may require bringing agencies together that may have had very little interaction in the past, but are actually working towards complementary goals or addressing overlapping issues. Advantages of working in collaboration can include the pooling or sharing of limited resources and expertise, and adopting a unified approach that can help avoid community confusion and disenchantment if separate groups interact with communities in different ways.

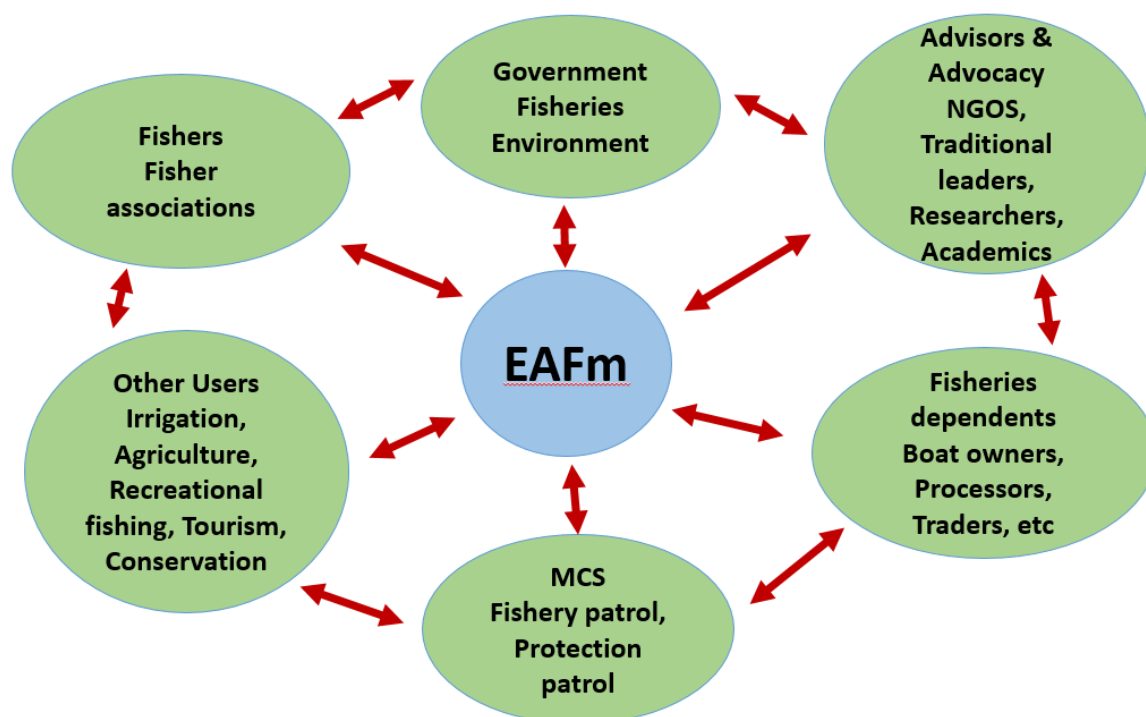
**Figure 8.1:** An ideal inter-agency cooperation and consultation EAFm framework (light blue) nested within IWRM and water management (dark grey)



## TASK VI. IDENTIFY AND PRIORITIZE STAKEHOLDERS AND ORGANISATIONS

The network of stakeholders that needs to be involved in EAFm is complex (see Figure 8.2), both in terms of vertical linkages (national to local), horizontal linkages (between different users of the natural resources) and in terms of geographic coverage. Many stakeholders may be needed to implement an EAFm effectively, especially in relation to surveillance or compliance.

**Figure 8.2:** Examples of stakeholder groups. Source: Adapted from FAO



### Who are your stakeholders?

**“A stakeholder is any individual, group or organization which has an interest in the EAFm process; or which can affect or is affected, positively or negatively, by the EAFm process.”**

Stakeholders are individuals, groups or organizations of men and women, old and young, who are in one way or another, interested, involved or affected (positively or negatively) by a particular process. They may be motivated to take action based on their interest or values. Stakeholders may include groups affected by management decisions; concerned about management decisions; dependent upon the resources being managed, with claims over the area or resources; with activities that impact on the area or resources; and with, for example, special seasonal, geographic or cultural interests.

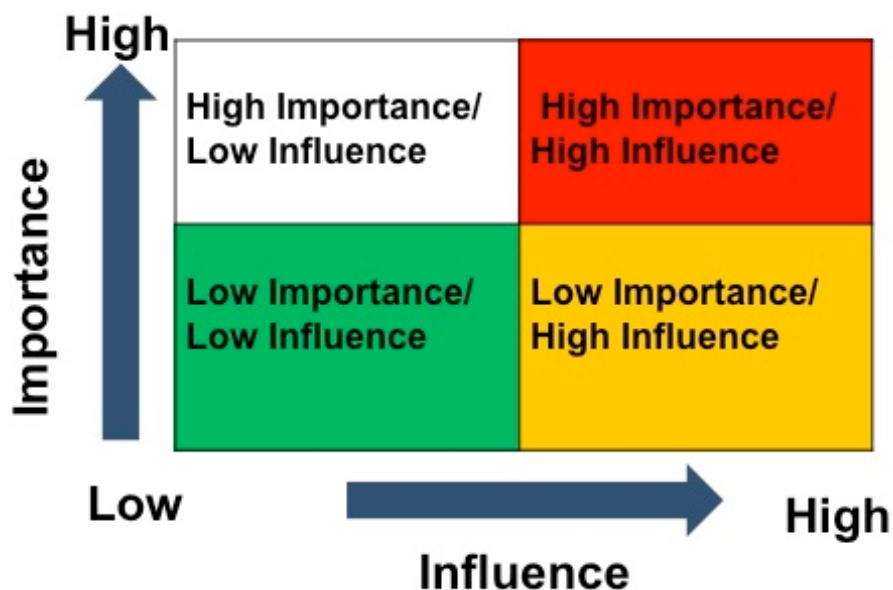
Key stakeholders need to be invited to the initial EAFm stakeholder meetings or workshops. A checklist of which stakeholders should be approached can be based on Figure 8.2. Finding the right balance between being inclusive so to engage as many stakeholders as possible versus having an unruly mob is difficult, but it should be borne in mind that consultations and fine-tuning of a plan can take place subsequently. In the first instance, it is important to include the people likely to be most affected by the planning process. This is most likely to include (i) the fishers (often selected though

fishers' associations including both small-scale artisanal fishers and larger-scale commercial fishers; (ii) government officers both at the national level (to set overall policy) and in the area of the fishery (to ensure implementation); (iii) NGOs; (iv) researchers; and (v) surveillance.

Support or lack of support by stakeholders can lead to the success or failure of an EAFm. Stakeholder analysis (see [People Toolkit](#)) should be conducted to identify potential partners for an EAFm, to explore possible approaches to inter-acting with a particular person or group who can be supportive or potentially hostile to an EAFm, and to provide insights into the dynamics and relationships of individuals and groups with various interests in a particular resource or project.

One form of stakeholder analysis is 2x2 matrix where stakeholders are plotted according to (i) how important the stakeholder is to the EAFm process on one axis (Y axis) and how much influence (power) they have over the EAFm process on the other axis (X axis) (Figure 8.3).

**Figure 8.3:** A 2x2 matrix importance and influence stakeholder analysis



According to where stakeholders fall on the matrix a different strategy can be adopted for the four groups (Figure 8.4).

There will be those that were (i) high importance and high influence (ii) those that were high importance and low influence, (iii) those that were low importance but high influence and (iv) those that were low importance and low influence.

**Figure 8.4:** Different strategies needed for the different groupings of the stakeholder analysis

High Importance & Low Influence	High Importance & High Influence
Need to be represented	Key stakeholders for EAFm Need to be included in the key stakeholder group
Unlikely to be interested	Need to get them to 'buy in' into EAFm process,'
Low Importance & Low Influence	Low Importance & High Influence

Those in the red box are the key stakeholders for EAFm success; they need to be kept motivated and on board as they are 'allies'. Keep communicating results to them. They should not need convincing about the importance of EAFm.

Those in green box are unlikely to be interested and have little influence; however, they still need to be kept informed and involved, with minimal effort and monitoring.

Those in yellow boxes require active strategies. High influence + low importance: these could to be moved along to the red box, but firstly they would need to 'buy into' the EAFm process. This could be worthwhile as if they are potential supporters they could use their influence to support the process.

**Note that:** some of the most influential stakeholders could also hinder/ work against the EAFm process (for political or other gains) so they need to engaged with frequently and actively monitored. Those with high importance + low influence are often the most affected (i.e. have a high stake in the EAFm process) but do not have the power or a voice to influence decision-making. They need to be represented and supported to allow them, to have more of a say and influence over the EAFm process.

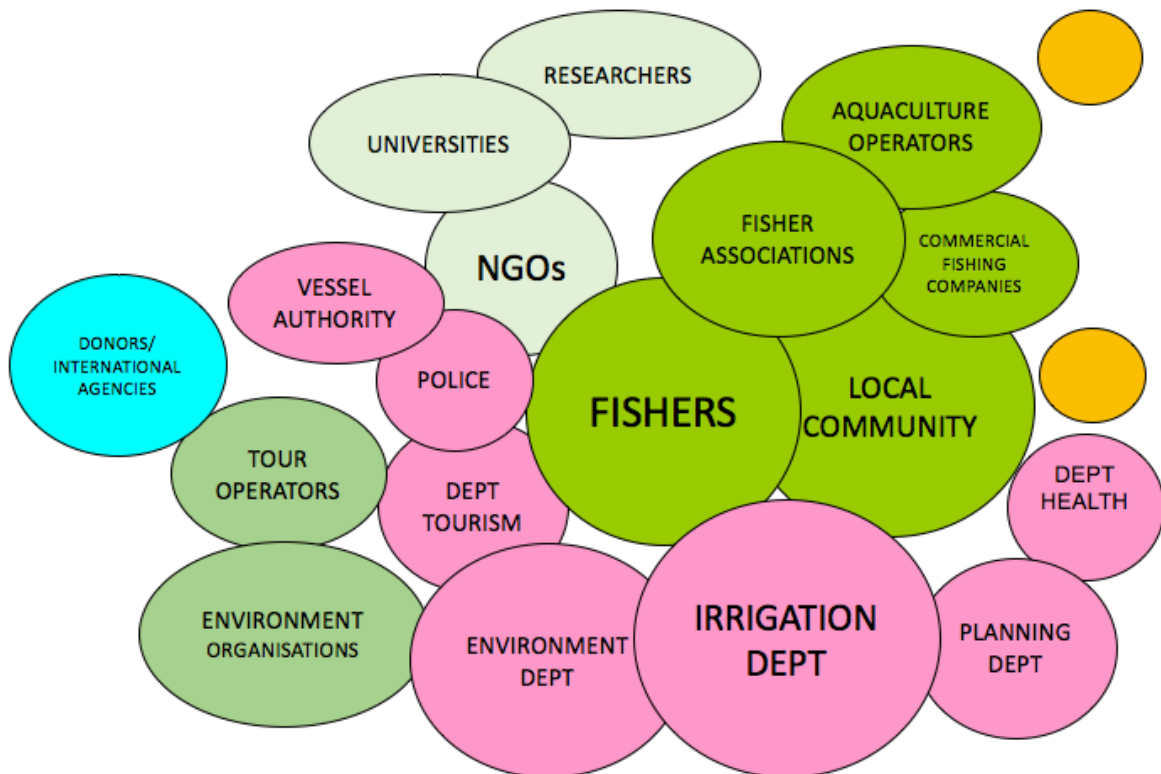
**Activity:** (i) List stakeholders, and (ii) conduct a stakeholder analysis,

Another way of understanding stakeholder relations and influence is to plot them on a Venn diagram that describes their relationships. In the diagram below, the size of each circle indicates the stakeholder's importance and the proximity of circle to others indicates the frequency/depth of contact.

Separate circles suggest that no contact currently exists; touching circles can suggest that information passes between institutions; a small overlap can show that cooperation in

decision-making is taking place and large overlap suggest that there is considerable cooperation in decision-making. An example Venn diagram is shown in Figure 8.5.

**Figure 8.5:** An example Venn diagram showing the relationships among stakeholders



Both types of stakeholder analysis can be repeated at the end of the EAFm process to determine how stakeholder influence and importance may have changed and how relationships between stakeholders has changed during the course of implementing the EAFm plan.

**Activity:** Plot the stakeholders on a Venn diagram.

### TASK VII. ESTABLISH A GROUP OF KEY STAKEHOLDERS

The Key Stakeholder Group is a small number of stakeholders (perhaps four or five depending on the prioritization process) representing different sectors of the community and management agencies who will work with the facilitators to guide the EAFm process after Startup. This group may include members of the initial EAFm team established in Task i. or be new people. The key group is crucial as it gives responsibility and power to the community members, and others not typically engaged in fisheries management.

The key group can 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.

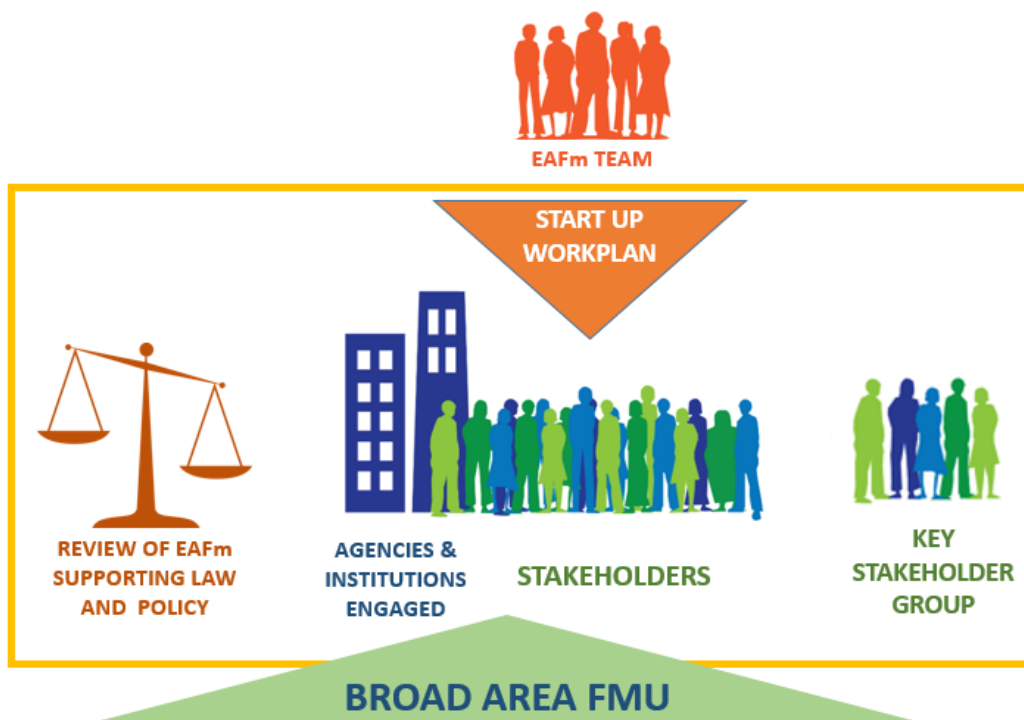
### **TASK VIII. DETERMINE THE LEGAL BASIS FOR EAFM**

It is desirable to have a legislative or policy mandate to undertake an EAFm. This is especially true in the case of co-management, because without it local communities may have no legal basis to engage in co-management. For example, in many traditional fisheries, customary management practices, such as no fishing areas, may exist or have existed in the past. These can often form a solid basis from which to introduce more formal co-management. The development of fisheries legislation should therefore provide this authority. In some countries, the development of community fisheries by-laws or fisheries management ordinances includes provisions to devolve management authority. Although establishing a legal basis for an EAFm is desirable, the lack of appropriate existing legislation should not be used as a reason to delay starting the EAFm process but this may best be promoted as a ‘pilot study’ intended to inform subsequent policy development. Nevertheless, reviewing the legal basis for EAFm is essential in order to understand existing supportive or non-supportive policies.

### **SUMMARY**

The eight Startup tasks in Startup A do not need to be carried out sequentially; in fact tasks are likely to be parallel or overlapping.

The minimum requirements to complete Startup A are depicted in Figure 8.6 and include: forming the EAFm team with a facilitator; making a Startup work plan; identifying stakeholders and forming a key stakeholder group; engaging with other agencies and institutions; carrying out a legal review and identifying the broad area of the FMU.



**Figure 8.6:** Summary of Startup A tasks

Use the Startup A checklist below to help you assess the Startup tasks and help write a Startup work plan.

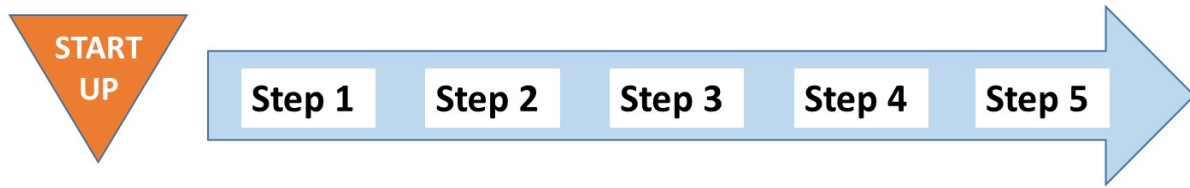
Startup A tasks	Completed or not	Notes
i. Formed EAFm team with a facilitator		
ii. Identified the broad area of the FMU		
iii. Developed a Startup work plan		
iv. Carried out EAFm introductions		
v. Coordinated with agencies & government levels		
vi. Identified stakeholders		
vii. Established group of key stakeholders		
viii. Carried out a legal review		

## **MODULE 9: STARTUP B - STAKEHOLDER ENGAGEMENT**

### **SESSION OBJECTIVES:**

- Apply participatory approaches for stakeholder engagement;
- Organize and hold stakeholder meetings;
- Describe the basic concepts of co-management.





## OVERVIEW

This module outlines what Startup B entails. It explains participation and facilitation; how to hold and facilitate participatory workshops/meetings which underpin the EAFm process. It also introduces co-management as a key approach for EAFm.

## INTRODUCTION

Stakeholder engagement is not a step: it is an on-going activity that is initiated in Startup B and continues throughout the EAFm process and will evolve over time. Stakeholder engagement activities build the knowledge and understanding of the EAFm team, key stakeholders and participating partners, agencies and institutions. Also refer to community mobilization methods outlined in [Module 16 Reality Check II](#) and many of the related tools in the [People Toolkit](#).

## PARTICIPATION

The benefits of broad participation include:

- a range of stakeholder perspectives;
- promoting actions (of what? from who? to benefit which stakeholders?);
- enabling an empowering process that
  - encourages independence and self-confidence
  - can be a catalyst for change;
- quick and cost effective results;
- enhancing a greater sense of ownership among stakeholders;
- stakeholder literacy is not essential;
- subjective insights are given value; and
- building relationships and partnerships.

It is also very important to identify champions or leaders who will provide the drive to follow through with the EAFm planning and implementation process and motivate others.

The three pillars of participatory approaches are:

- **Attitude and behaviour:** the facilitator's attitude and behaviour are critical to the success of participatory workshops. He/she must remain neutral, manage discussions fairly and engage with all those present.

- **Tools:** there are various tools that can be used to elicit participation from members of the population (see [People Toolkit](#)). However, these tools are only effective if used with the correct attitude and behaviour as explained above (i.e. non dominant).
- **Sharing:** sharing information, knowledge, opinions and feelings is a key element of any participatory process. Through such sharing, people are empowered and contentious issues can be discussed and resolved, or at least brought out into the open, where they can then be managed through conflict resolution (see [Module 12 Reality Check I](#)).

“An important aim of the participatory approach is to empower people and groups who are most vulnerable and less able, to ensure their needs and expertise are represented in decision-making. For the EAFm process to succeed, male and female resource users, local organizations and communities, as well as local government officials and other stakeholders need to be enabled to take control and make pragmatic decisions. To do this they will need to increase their awareness and understanding of fisheries resources and their management in an ecosystem

The benefits of empowerment include:

- increased awareness, knowledge, skills, institutional capacity;
- ownership of decisions and outcomes;
- responsibility for addressing issues;
- power to act and make decisions;
- motivation; and
- sustainability.

## GOOD FACILITATION

A facilitator is usually a neutral, independent person whose role it is to support individuals, groups and organizations during participatory processes (this can extend to practical administrative tasks, but here we focus on content and process).

Facilitators need to be keenly aware of how power relations and dynamics permeate all group processes. For this reason, they need to pay particular attention to:

- **gender dynamics** (primarily, though not always, women not speaking up at meetings where men are present);

- **social hierarchies** (e.g. elders' views or presence can limit what younger members/others can say, whether in a village or in a government department) and
- **socio/cultural differences** (for example, ethnic minorities not having a voice) and power dynamics (for example larger scale operators or politicians dominating a discussion)

Good facilitation involves:

- trust in other people and their capabilities;
- patience and good listening skills;
- self-awareness and openness to learning new skills;
- confidence without arrogance;
- good life experience
- common sense;
- respect for the opinion of others, not imposing ideas;
- ability to create an atmosphere of confidence among participants;
- flexibility in changing methods and sequences; and
- knowledge of group development including the ability to sense a group mood.

A key element in any communication is building rapport, i.e. the feeling between two people that they can relate to each other. In many of the situations, establishing a rapport of trust is crucial for ensuring a message is received and understood as intended. A good facilitator knows how to build rapport.

Facilitators enable groups to work out issues effectively by:

a) Encouraging full participation, overcoming self-censorship

Often people don't say what they really think. In most groups the norm is that if an individual wants to speak, they do so simply and clearly and say something familiar enough or interesting enough so that the group will listen. Without realising it, most people constantly edit their thinking before they speak. Facilitators have the skills to draw people out and allow everyone's voice to be heard. They know how to make room for quiet members, how to reduce the incidence of premature criticism and how to keep everyone thinking instead of shutting down.

b) Promoting mutual understanding and overcoming fixed positions

A group cannot do its best thinking if the members don't understand each other. Most people find it difficult to free themselves from their fixed viewpoints. A facilitator helps the group to realise that productive groups are built on a foundation of mutual understanding. The facilitator also recognises that misunderstandings are inevitable and are stressful for everyone involved. People in distress need support and to be treated respectfully. Therefore, a facilitator knows not to take sides, to honour all points of view and to keep listening, so that each and every person feels confident that someone understands them.

c) Fostering inclusive solutions and changing the win-lose mentality

Many people are stuck in conventional mind sets for resolving problems and conflicts, believing it is either one way or the other - they rarely imagine that they might reach an agreement that benefits all parties, sometimes referred to as a 'win win situation'. An experienced facilitator knows how to help a group search for innovative ideas that incorporate everyone's point of view. It is a challenging task, but once the group understand the values and methods that foster inclusive solutions, the impact can be profound. As they discover the strength of this new way of thinking, they may become more hopeful about their group's capacity to resolve issues.

d) Teaching new thinking skills and improving the management of meetings

It is easy to blame a poor meeting on a leader, or on others. A facilitator has both the opportunity and a responsibility to teach group members how to design and manage effective sharing, problem-solving and/or decision-making processes. Preparation in advance of meetings is essential.

e) Designing explicit and clear procedures for running meetings/workshops

Clear, explicit procedures are among the most important thinking skills a group can learn. Having an explicit and agreed objective and a clear agenda to achieve it can make a huge difference to the running of a meeting and the behaviour of its participants. A facilitator can train the group in a range of procedures for running successful meetings/workshops.

f) Structuring thinking activities

Sometimes a group needs help to focus on a single challenging issue. At times like this, a structured thinking activity, like brainstorming, can be helpful. An experienced facilitator will have a range of activities to encourage thinking processes to offer to groups at the appropriate time.

g) Using clear language to describe group dynamics

When a facilitator enables a group to reflect on its own group dynamics, and links this to a model of group dynamics, he or she provides group members with shared points of reference and a shared language. This enables the group to step back from the content of their discussion and talk about Process, so that they can improve the dynamics of the meeting.

**Activity:** Draw a good and a bad facilitator.

## FACILITATING PARTICIPATORY EAFm STAKEHOLDER WORKSHOPS

The aim of the initial EAFm workshops or meetings is to agree on:

- the selected FMU (**Module 10 Step 1.1**);
- who are the major stakeholders that need to be involved (**Module 8 Startup A** task vi); and
- the scope of the FMU by defining a broad management goal ☺ (vision) and eliciting background information (**Module 10 Steps 1.2 and 1.3**).

An EAFm stakeholder workshop involves a meeting with multiple stakeholders to:

- involve stakeholders in discussing ways of improving fisheries-related situations that affect them;
- form a social interaction that enables different individuals and groups, affected by an issue or initiative, to enter into dialogue, negotiate, learn and make decisions for collective action; and
- Inspire government staff, policy makers, community representatives, scientists, business people and NGO representatives to work together for the EAFm.

Workshops can combine training, development, team-building, communication, motivation and planning and should have a clear purpose or output to be generated through the workshop process, rather than just being an awareness raising exercise.

In the initial meetings, the purpose should be to agree to EAFm Steps 1.1 - 1.3. Participation and involvement in workshops will increase the sense of ownership and empowerment of the participants and facilitate the capacity development of the organisations and individuals involved.

Workshops are effective in helping to manage or facilitate change, achieving progress and creating initiatives, plans, processes and actions to achieve objectives. They are also good for breaking down barriers, and improving communications (inside of and between) agencies and between other groups and communities.

#### **One possible scenario for early stakeholder consultations:**

As an introduction, the facilitator should outline the objectives and the mode of working for the workshop. Next, he or she would present the five EAFm steps (as described in [Module 7 EAFm Process Overview](#)) and explain that preparatory work had been done for step 1.

Next, the facilitator should present information on the potential FMU (one slide suggested), and on who the potential stakeholders are, based on the preparatory work done earlier (see [Module 8 Startup A](#)). An activity is then facilitated to seek agreement on the FMU and the major stakeholders.

The facilitator should then present (in two to three slides) the broad FMU management goal and the background to the fishery. More activities are facilitated to a) discuss the goal and adjust if necessary; and b) discuss the background information, asking stakeholders to identify mistakes and gaps. To help define the FMU, scope and background, activities could include:

- brainstorming sources of information needed to compile the background information, statistics, relevant research, policies, legislation, etc;
- a short visit to a fishery landing site, or a local market and through observation and interviews or facilitated discussions, understand the scope of the FMU.

The facilitator should then summarize all that has been agreed, list the next steps and discusses how this information will be communicated back to stakeholders in a format they find suitable.

This would be the first of several meetings/workshops that will take place as the EAFm process evolves and as stakeholders participate more actively. Similar meetings/ workshops will be needed for [Module 11 Step 2 and Module 13 and 14 Step 3](#).

See [Module 10 Step 1.3](#) for a detailed description of how to scope and profile the FMU.

## ASSESSING STAKEHOLDER INTEREST AND COMMITMENT

Once stakeholders have been identified, it is necessary to understand their attitudes and positions in relation to the EAFm. The stakeholder engagement matrix ([Tool n.18](#)) can be used to work out where various stakeholders are positioned, and depending on this, help identify the type of actions needed to move forward. For example, it may be necessary to work on community mobilization at the same time as awareness raising (see Section 6 below, [Module 16 Reality Check I](#) and [People Toolkit](#)). A community needs to be organised to engage in the EAFm process. They need to be aware, self-reliant, empowered, and able to promote new values, build relationships and foster leadership – all this can lead to action.

Alternatively, it may be necessary to work on lobbying/advocacy with local government officials, ministers, donors or funding agencies. This involves a different personal skill set, including the ability to write policy briefs, and knowledge of the political environment (see [Tool n.37](#)). Networking with other stakeholder groups is also important (e.g. with NGOs, research bodies, etc.) to gather information, seek strategic alliances and for the process to gain momentum. Another approach is to work through local, national or even international media. Traditional and social media can also be used, not only to raise awareness but also to lobby and gather public support for the EAFm.

Measures must be put in place to ensure the participation of all key stakeholders. This is a challenge in cases, where fishers may not be part of a large organization or federation and their reaching all key stakeholders requires significant financial resources and time. The representation of stakeholders may also be a flawed process, where political leaders may be charged with leveraging benefits from government and acting as an interface between the electorate and government. This may mean that there could be 'filters' in the process of dialogue and representation, whereby measures or processes that require politically unfavourable outcomes may be distorted or filtered out during dialogue. This may require a process to ensure that representation is valid and that the small-scale fishers, farmers and other resource users are adequately represented in a manner that corresponds with their priorities and interests.

Broadening stakeholder involvement in the management process is a central principle of EAFm. Through consultations and negotiations, the partners should develop a formal agreement on their respective roles, responsibilities and co-management. This should include the right to be involved in the design and implementation of management actions  
😊.



## CO-MANAGEMENT

There is a strong linkage between the ecosystem approach and co-management and they can be largely complementary. The rights, and the degree of empowerment of stakeholders, have an important impact on their ability to engage in decision-making and implementation processes.

Fisheries management approaches can be “top-down”, i.e. fully implemented by, and the responsibility of, governments, or “bottom-up”, where community-based management allows for the full devolution of responsibilities to communities/fishers. In reality, co-management arrangements usually exist somewhere between these two extremes. The term co-management is used to describe the varying degrees of involvement/interaction between government and communities (Figure 9.1).

**Figure 9.1:** The relationship between co-management, community-based management and government management (adapted from Pomeroy and Berkes, 1997)



The amount/level of joint management varies in each co-management system according to the degree that state entrusts management to communities, or level of control that the state is able to exert in the fishery

Co-management can therefore be defined as:

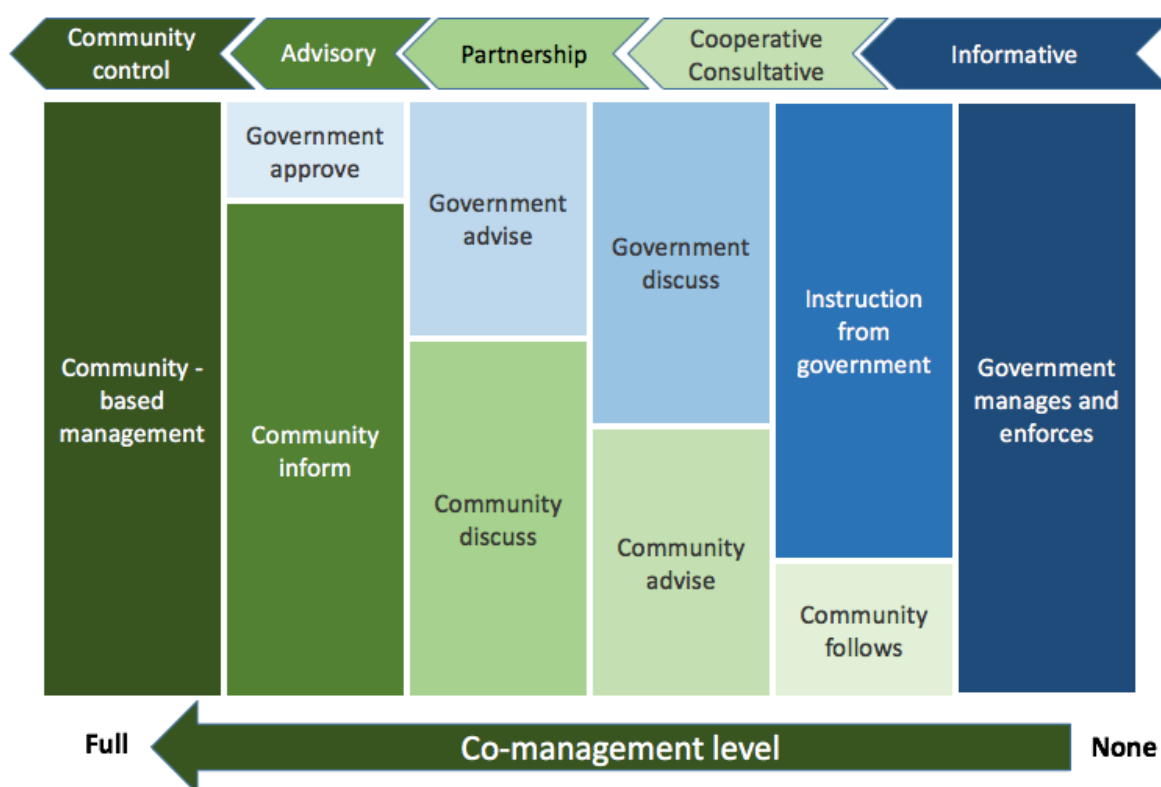
**Arrangements in which a partnership of local resource users, government, other stakeholders and external agents share responsibility and authority for the co-management of the fishery, with various degrees of power sharing**

Degrees of power sharing can be defined as follows (see Figure 9.2):

- Community control: power delegated to the community to make management decisions and inform government of these decisions;
- Advisory: users advise government of decisions to be taken and government endorses these decisions;
- Partnership: a partnership of equals with joint decision-making;

- Communicative: two-way information exchange, local concerns are represented in co-management plans;
- Cooperative: community has input into co-management;
- Consultative: mechanisms exist for government to consult with fishers, government makes all decisions;
- Informative: community is informed about decisions that government has already made.

**Figure 9.2:** Degree of control and consultation in different forms of fishery management



Through consultations and negotiations, the partners develop a formal agreement on their respective roles, responsibilities and rights in co-management.

Some advantages of co-management include:

- more open, transparent, accountable and autonomous management process;
- more economical than centralized systems, ultimately requiring less to be spent on administration and enforcement;
- fishers and key stakeholders take responsibility for a number of co-managerial functions;
- communities and resource users develop a flexible and creative co-management strategies, that meet their particular needs and local conditions (seen as legitimate);
- the emergence of local solutions to solve local problems;
- improved stewardship and public awareness of aquatic and coastal resources management ; and finally



- progress towards a more democratic and participatory society/community;

Co-management initiatives can foster these benefits. They can help to reduce conflict between stakeholders and government, as well as between stakeholders themselves, by i) clearly defining rights and responsibilities; ii) providing an institutional forum for discussion among decision-makers, and iii) encouraging support for the co-management process. They also have the potential to build a conservation ethic, by bringing fishers and other resource users into the decision-making process, so they can share responsibility for long-term sustainability of the fishery.

Challenges include:

- The approach may not be suitable for all stakeholders.
- Some stakeholders may not be willing or able to take on the responsibilities of co-management;
- a long history of dependency on government and top-down management styles may take years to reverse.
- Leadership and appropriate local institutions such as fisher organizations, to initiate or sustain co-management efforts may not exist within the community
- Initially the, high initial investments in time, financial and human resources are may be required to introduce co-management;
- for some individuals and communities, incentives (economic, social, political etc) – to engage in co-management may not be present; and
- the risks involved in changing fisheries management strategies may be too high for some communities and fishers.
- In some cases, the time taken for fisheries to show an improvement following the strengthening of co-management, may discourage some.

The co-management approach can be applied at any scale, from that of a single component (fishery type, fishing gear type, geographical area) of a single fishery, through to multi-stakeholder, multi-resource, multi-use situations, which will arise within the context of integrated management ☺.

Although the principles of co-management are essentially the same within large-scale and small-scale fisheries, the policies and modalities for implementing them may differ.

Co-management is not just a concept that involves the rural poor, local communities and government, but must incorporate all types of fishing and impacts on the resources. For example, having good stewardship of aquatic resources by one group of communities that are then exploited by incoming fishers from other localities can be counter-productive and will inevitably lead to the breakdown of the co-management system.

**Activity:** Practice active listening.

For more details on tools and techniques that can be used for co-management see **[People Toolkit](#)**, as well as **[Module 16 Reality Check II](#)**.

**Consultation Tools:** <http://www.fao.org/fishery/eaf-net/topic/166247/en>

## AWARENESS RAISING

Awareness raising is a critical ingredient in the transformation of stakeholders into active co-management. Awareness raising can empower people and improve their environmental awareness through increased knowledge. As part of the EAFm stakeholder engagement process, an awareness raising campaign should include activities that are relevant to stakeholders and their goals for sustainability, and which should emphasize the links between local resource-use activities and the quality of the environment. Too often, awareness raising is not targeted at those who are most important in resource use and management. See [Tool n.9](#) on how to carry out an awareness raising campaign.

Refer to the [People Toolkit](#) and EAF-net for more about participation and awareness raising methods, and to pick up tips and suggestions for improving your facilitation skills.

## COMMUNITY MOBILIZATION

In this section we focus on how to mobilize communities for better EAFm. The active participation of people in a community is at the heart of co-management. The success of co-management is directly related to well-organized communities that have been empowered to take action to manage and conserve their fisheries resources and associated habitats. Community mobilization for EAFm is about much more than establishing organizations; it is a process of empowerment, building awareness, promoting new values and behaviours, establishing self-reliance, building relationships, developing organizations and leadership, and enabling communities to take action. Through this, communities can be readied to take part and contribute fully to the EAFm process through co-management.

It is useful to note that the term “community” can have several meanings. Community can be defined geographically by political, boundaries, or socially as a community of individuals with common interests. For example, politically a geographical community is usually the village unit (often the lowest governmental administrative unit); a social community may be a group of fishers using the same fishing gear, or a fisher organization.

Care should also be taken not to assume that a community is a homogeneous unit, as there will often be different interests within a community, based on gender, class, ethnic and economic status. Recently, the term “virtual community” or “community of interest” has been applied to non-geographically based communities of fishers. Similar to a “social community”, this can be a group of fishers who, whilst they do not live in a single geographical community, use similar gear or target the same fish species, or have a common interest in a particular fishery.

To participate in co-management, stakeholders will need to organize themselves and arrive at an internal consensus on the interests and concerns that they want brought forward ([Modules 10 and 11 Steps 1-2](#)). Meetings and discussions should be held among the individual stakeholders to identify and clarify their interests/concerns and for enable those individuals who share common interests/concerns, to organize themselves into groups. The key stakeholder group established in [Module 8 Task vii](#), should play a liaison role between the wider stakeholders and the EAFm team.

Effective community participation in co-management requires strong community organizations to represent their members. In some cases, community organizations capable of representing their members in co-management already exist.

In other cases, organizations will either need to be strengthened or newly established. One or more community organizations may be needed in the community depending upon its size, diversity and needs. An appropriate person from the community organization should be selected to represent them in larger co-management networks and associations.

Fishing and fisher associations exist in many communities. However, these organizations will not automatically be suitable as representative organizations in co-management. It is likely that they were established with objectives that related more to improving marketing, or as a conduit to distribute government subsidies and to increase the incomes of members.

Changes in outlook may be necessary for these organizations to play major roles in resource co-management. These changes may be difficult and lengthy, especially if the organization is still struggling to meet its original mandate, and putting more focus on co-management may strain their internal cohesion. The EAFm team and facilitators need to be aware of all these possibilities.

Co management organizations can be strengthened through:

- environmental education;
- social communication;
- building alliances and networks;
- organizational sustainability to keep members and funding; and
- human capacity and organisational development.

The first four points above are explored in more detail in community mobilization in [Tool n. 10](#).

## **MODULE 10: STEPS 1.1, 1.2 & 1.3 DEFINE AND SCOPE THE Fishery Management Unit**

### **SESSION OBJECTIVE:**

- Defining, describing and scoping the Fishery Management Unit (FMU);
- Undertake visioning and be able to agree on a vision.



## OVERVIEW

This module outlines how to define the Fisheries Management Unit (FMU), how to agree a vision ☺ for it, and the various elements to consider for scoping ☺ the FMU.

## INTRODUCTION

A successful EAFm plan requires a clear statement of the area to be managed – the FMU. In **Module 8 Startup A Task ii**, the broad area was identified. Now you need to define the FMU more precisely so as to inform team staffing, stakeholder engagement and general information gathering.

### 1.1 DEFINE THE FMU

Fisheries management can be applied at a number of geographic scales, ranging from a large lake ecosystem to a small community managed wetland. However, EAFm works best at the level of a “fishery” and it is important to clearly define the area to be managed, i.e. the FMU.

For EAFm, the FMU should be:

- multi-species (i.e. the main targeted species and other species, (including other aquatic animals that are caught as bycatch or are impacted by the fishery);
- multi-gear, if fishers targeting the same species and, conflicts between them occur, and
- multi-jurisdictional, different jurisdictions involved.

Ideally, the chosen FMU should:

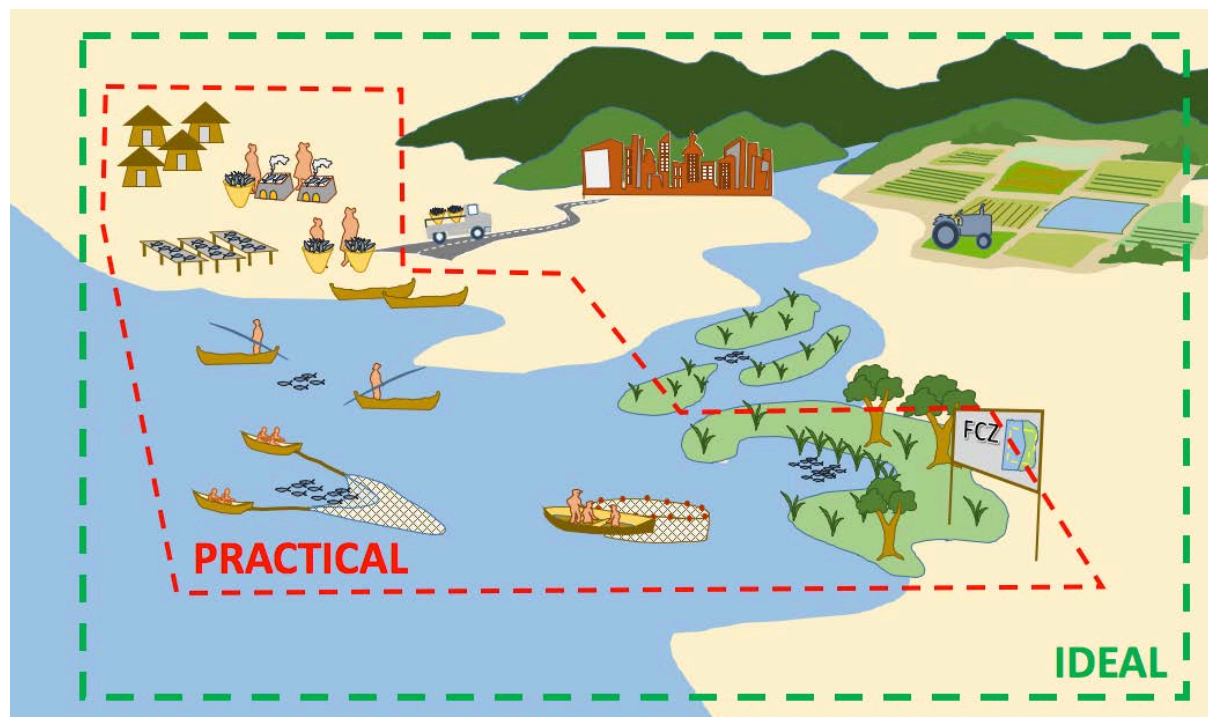
- relate to a known ecological boundary (e.g. lake/reservoirs/wetland or a significant stretch of a river system). This may be difficult to achieve in a practical sense as larger scale ecological boundaries seldom coincide with political boundaries and may be ‘nested’ (**Module 4 Principles of EAFm**);
- cover the whole of the geographical range of the main stocks; and
- cover all the gears that are fishing, including gears used by small-scale artisanal fishers ☺ and large-scale commercial fishers.
- Take into account seasonal changes in water levels and boundaries.

Ecosystems are often nested and on different geographical scales. To re-iterate a previous example, considering a fishery adjacent to a community may be adequate for non-migratory species such as tilapia that is fished almost exclusively by that community, but totally inadequate for a migratory fish such as most riverine catfish species as they will be targeted by different stakeholders ☺ and with different gears along the river at different times of the year..

When the ideal FMU cannot be achieved, the lack of complete coverage must be acknowledged and considered in the planning. Where too much of a species’ range falls

outside the FMU – for example, a large river system (e.g. Mekong River) or a large lake (e.g. Lake Victoria) fishery where the stock is shared by two or more countries, then every effort must be made to engage the other parties in the planning (Figure 10.1).

**Figure 10.1:** The ideal versus the practical FMU in a large Lake

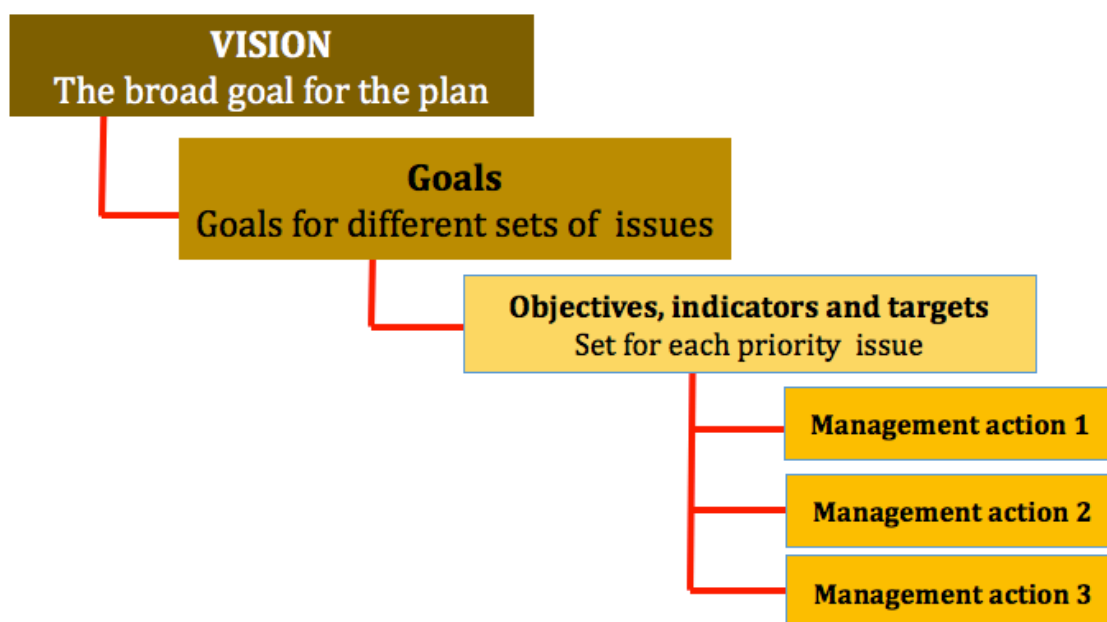


**Activity:** Map the FMU.

These should be hand drawn. FMU boundaries can be drawn to approximate scale through using Google Earth images.

## 1.2 AGREE ON THE FMU VISION

It is now important to agree on a vision for the FMU. A vision is the top-level aspiration of what the future will look like if fisheries co-management is successful. This should be in line with national or provincial policies and legislation. There is a set hierarchy of vision–goals–objectives–actions (see Figure 10.2 below).

**Figure 10.2:** The EAFm plan hierarchy**An example of a vision:**

*“Enhance the socio-economic benefits of the FMU through the sustainable and responsible use of the fishery resources and the broad ecosystem where they are found”.*

Goals, objectives indicators, targets and and management actions are discussed in detail later in the course.

**Activity:** Agree on the vision for your FMU.

**1.3 SCOPE THE FMU**

Once the location and boundaries of the FMU have been defined and the Vision has been agreed upon, the FMU needs to be scoped and profiled so as to bring together all the relevant background information. This information will then serve as:

- a basis for all EAFm planning and management activities;
- a baseline for future monitoring and evaluation of co-management performance.



The process of scoping and profiling the FMU is outlined in detail below but in some cases it may not be necessary to carry out all of the steps in depth; the actual FMU scoping document may be relatively brief when background information is limited. It is also important to recognize that much of the information may have been collected already and is held by different agencies, organizations and stakeholders. In such cases the exercise can be basically one of compilation and collation.

The FMU profile should address a broad range of information across different disciplines and technical fields, including social sciences, natural sciences and political sciences.

The EAFm team should work with stakeholders and the key stakeholder group to profile the fishery. The broad range of interests and dimensions to the fishery should be captured in this profile. In practice the most important consideration for the team is a balance of expertise, so as to collect data that are relevant and useful. These data can then act as a baseline for assessing change over time and can be a starting point for monitoring performance.

The FMU profile should help to answer these key questions:

- What is the current condition of resources, and the patterns and problems associated with resource use?
- Who are the main stakeholders in the fishery and how do they benefit?
- What are the governance patterns in terms of resource access and use, i.e. between and within, gender, ethnic groups, elite groups and social hierarchies?

## INFORMATION NEEDS

Scoping is underpinned by data, information and knowledge derived through formal scientific process and through traditional knowledge, noting that the framework for EAFm is such that a lack of data should not be an obstacle to getting started.

In the following section “research” is used broadly to mean obtaining and verifying data and information, either from existing sources or from new activities. Depending upon the FMU vision, this research may only involve those stakeholders associated with particular activities. When it is not possible to research all of the stakeholders, it may be necessary to set priorities as to which stakeholders to focus on. This can be done by noting three factors:

- Their proximity to fishery resources ☺
- the impact that stakeholder activities have on resources; and
- the relative levels of livelihood dependence of stakeholders on the resource.

“Indigenous or local knowledge” of resource users and other community members (from different genders, ethnic groups, social groups, etc.) is critical information for planning and co-management. The FMU information gathered therefore needs to be a balance of scientific information and indigenous knowledge. Information collected will therefore differ depending on the research methods used, as well as the profiles of those who are collecting the data. The key stakeholder group will determine the profile scope/scale based on decision-making information needs and available resources or time. The collection of information for the scoping exercise may take several weeks to several months to complete depending upon the scope and scale of information needed.



Three assessments needed for the FMU scoping and profiling process reflect the three EAFm components:

1. Resource and ecological assessment;
2. Socio-economic assessment; and
3. Legal and institutional assessment.

More detail on these assessments can be found in [Tools n.20, 21 and 22](#).

There will likely be insufficient information to answer all questions regarding the impacts of policy choices, but there is usually enough to identify the interactions between species and sectors, and the direction of particular human impacts on living aquatic organisms and freshwater ecosystems, as well as the social and economic impacts.

Data can be either quantitative or qualitative. Quantitative data are a numerical measure, i.e. “who, what, when, where, how much, how many, how often,” and are usually obtained through standardised interviews, biophysical surveys and surveys using closed questions. Qualitative data often refer to “how and why” and can be obtained informally, e.g. through free and guided interviews, (including focus group discussions); surveys using open-ended questions; participatory methods; observations; and the interpretation of documents.

When data are poor, scoping can be carried out with a qualitative conceptual model via stakeholder engagement. In this case, the data come from synthesizing informal or disparate sources of information and from exploring the participants’ understanding of the ecosystem.

In data rich systems, i.e. when there are data describing major system drivers or threats, sophisticated ecosystem simulation models and sensitivity analyses can reveal which connections in the system are strongest and most affected by management. The species or processes associated with the strongest connections should be identified as a possible focus for setting plan goals.

Statistical analysis can quantify the most critical connections in the system in data rich situations, but statistical analyses can be time consuming and require a certain skill set, so conceptual modelling can provide a good alternative. Either way, for socio-economic and governance issues, it is good practice to always include qualitative data as these can often be used to explain or elaborate upon quantitative data. Statistical analyses can provide evidence to make inferences about the system, but generally more detailed information and interpretation will be required to explain the complex social, ecological and governance components of the fishery.

An EAFm is an information driven and guided process, it is therefore important to note that data/information is a cross-cutting consideration and is not only required for scoping. Included within an EAFm plan is a monitoring system ([Module 13 Step 3.1, 3.2; Module 17 Step 5](#)). This monitoring system ensures that further data relevant to the impact of co-management on the fisheries system will be collected. This means that through time, uncertainty can be reduced and an understanding of the coupled socio-ecological system can grow.

EAFm is also an adaptive management process where a lack of information should not preclude action, i.e. the precautionary approach (less information = more caution).

Existing information and traditional knowledge can be utilized, as long as it is verified and validated.

As resources permit, the transition to a more sophisticated information gathering process can take place over time. A gap may exist between information required for fisheries co-management and the activities of fisheries research agencies. A direct advantage of the cooperative and participatory nature of EAFm is that it should prompt dialogue between the stakeholders tasked with co-management, namely fisheries and related research departments, academic researchers from various sectors and communities. This should help to align the research agenda more directly with the information requirements for EAFm and thereby stay relevant to the issues facing the fishery.

Once key information, parameters and illustrations have been assembled, it is time to validate these findings by presenting them to the stakeholders for discussion and comment. Validation can take place in various forms:

- small discussion groups with key stakeholders;
- presentations to specific groups of stakeholders or interest groups;
- presentations to groups of selected representatives of different stakeholder groups; and
- community meetings involving a wider range of stakeholders.

**Activity:** Discuss what type of data and information is needed for scoping, what methods are used to obtain it and what sources will be used?

## SHARING INFORMATION

Unless there is a common need or cause, there appears to be little incentive to share data and information (except in formal scientific publications). Often there is a surprising amount of data and information already collected, the challenge is to know where to find it:

- Structural fishery statistics (Department of Fisheries – national sub-national)
  - catch, effort, stock assessment economics
- Biological/ecological, habitat, environment (Ministry of Environment, Water Department, University and research institution studies)
  - Ecological monitoring, research results
- Socio-economic data (National or local surveys by other Ministries or research groups)
  - who and how people use the resource and how they benefit
  - issues with the current governance arrangements

There is also the possibility that some additional information may need to be gathered, to fill a critical gap for an important issue.

There are challenges to sharing data between national agencies – an example is food

security situations in fishing communities that may be held by related ministries, and fish catch data that is usually held by fishery departments. The two agencies may not always share their data, preventing a more complete understanding of the importance, (or otherwise) of domestic fish consumption in fishing communities.

Fishery information sharing across boundaries occurs when there is a joint management regime. It also occurs as an obligation to regional fishery management organizations that inform the development of common management actions and decisions or need for action on the target stocks, bycatch species or sometimes habitat impacts. The case study of Lake Victoria is a good example of this.

Fishery information (often statistical) is also reported to regional or international bodies (e.g. FAO,) as part of an obligation or as an undertaking to support regional knowledge. However, countries and organizations are often reluctant to release raw data and regional data is often presented as summary information.

Fishery research (which may be joint or coordinated) may result in the transboundary sharing of results or even of raw data. Regional or bilateral research programs encourage analyses across countries. Alternatively, research on a similar topic across several countries, can offer the opportunity for researchers to compare notes and look at issues in a broader context (e.g. role of flooded forests as fish habitats; fishing gear selectivity; fish migrations), that can then advise regional norms on best practice or management.

NGOs typically work in an advocacy mode and the information that they gather may be communicated to try and influence policy or decision-making, or to support a particular stakeholder group and empower them in negotiations or to leverage (political/financial) support. The information is sometimes trans-boundary in nature, especially if the NGO in question is an international NGO and may have projects or be focused on different issues in several countries (e.g. ornamental fish trade, labour migration/human rights abuse).

Participatory EAFm should foster the better sharing of information, a lot of which should be recorded in the EAFm plan. EAFm interest in both scientific and traditional/local knowledge for planning purposes, will encourage more active participation and allow for individuals/groups to share information equally. The use of traditional or local ecological knowledge should be given adequate consideration.

## FILLING OUT THE EAFm PLAN

Finishing Step 1 allows sections 1 and 2 of the EAFm plan template to be filled. Suggested subheadings for the BACKGROUND are given as a guide.

EAFm PLAN FOR FMU [NAME]	
<b>1. VISION</b>	The broad goal of management.
<b>2. BACKGROUND</b>	Description of the area and resources to be managed, including maps at different scales.
<b>The fisheries management area:</b>	Area of operation of the fishery, jurisdictions and ecosystem "boundaries" (including national/province/district jurisdictions).

- 
- Map of FMU.
- 

**History of fishing and management:**

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- Brief description of the past development of the fishery in terms of fishing gear, fish targeted, people involved, etc.
- 

**Current status of the fishery :**

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- Description of the fishery resources and fishing gears used;
  - Resource status;
  - Map of resource use patterns, including adjacent land use resources.
- 

**Current management (co-management) arrangements:**

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- Existing (co) management arrangements
- 

**Socio-economic benefits, including postharvest:**

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- Description of stakeholders and their interests (including socio-economic status);
  - Description of other uses/users of the ecosystem, especially activities that could have major impacts and arrangements for coordination and consultation processes;
  - Social and economic benefits, both now and in the future.
- 

**Special environmental considerations:**

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- Details of critical environments, particularly sensitive areas and endangered species.
- 

**Institutional aspects:**

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- Legislative background;
  - Existing co-management arrangements – roles and responsibilities;
  - Monitoring and enforcement arrangements;
  - Consultation process leading to plan development and on-going activities;
  - Details of decision-making process, including recognized participants;
  - Nature of rights granted in the fishery and details of those holding the rights;
  - Maps of management interventions/user rights/jurisdiction boundaries.
-



## **MODULE 11: STEPS 2.1, 2.2 & 2.3 IDENTIFY AND PRIORITIZE ISSUES AND GOALS**

### **SESSION OBJECTIVES:**

- Identify your FMU-specific issues;
- Prioritize issues through risk assessment;
- Develop goals for the EAFm plan



## OVERVIEW

This module outlines how inland fisheries related issues can be identified and broken down into the three EAFm components, before being assessed for risk. It explains how to define goals for the EAFm plan.

## INTRODUCTION

During the initial participatory workshops with stakeholders an important activity is to identify all issues relevant to the fishery, to help stakeholders decide where to focus the management system so as to generate the best outcomes for stakeholders.

To assist with this process, the issues can be separated into the three EAFm component groups:

1. Ecosystem well-being ☺ – all ecological “assets” (e.g. stocks, habitats, ecosystems) relevant to the fishery and the issues/impacts being generated by the fishery that may be affecting them.
2. Human well-being ☺ – the social and/or economic “outcomes” currently being generated by the fishery, both the good (those outcomes the community wants to have. e.g. food security and economic development) and the bad (those it wants to avoid, e.g. conflicts and injuries).
3. Good governance ☺ – the institutions and management in place, or proposed, to deliver the wanted outcomes (e.g. access and tenure systems, compliance, democratic processes, conflict resolution and institutional arrangements) along with the external “drivers” (not controlled by the fishery) which may be affecting performance.

The identification process must cover all direct and indirect impacts of fishing activities on fish that are retained and any aquatic species that are discarded; on the broader ecosystem; and the wanted and unwanted social and economic outcomes on both the fishers and the community.

The process should also identify all the elements needed to enable the effective governance and administration of the fishery, including legislation, plans, consultation, compliance, etc.

Finally, it also records any issues external to the management system that could affect the performance of the fishery, including natural (e.g. climatic) and human induced ecological (e.g. pollution), social (e.g. international attitudes) or economic (e.g. exchange rates) impacts.

Because a large number of issues can be identified, the key part of the whole EAFm process is to ensure only the most important are addressed by direct management

intervention. This requires a determination of their relative priority using some form of risk assessment and/or prioritization procedure.

Such procedures should be based upon the fishery managers trying to deliver the three components of EAFm, not just the ecological ones. A successful planning process relies, for the most part, on the prioritization of the identified issues.

## 2.1 IDENTIFY THE ISSUES

An evaluation of issues associated with the fishery needs to be guided by the high-level policy goals set at the national or regional level; the broad management vision of the FMU; and, if possible goals that should be consistent with existing or proposed new legislation. Fisheries policies and management plans often stop at broad goals, but in cases where the issues and objectives are broad, it may be difficult to set practical management objectives ☺ that co-management can address. A number of tools are available to help develop and categorize the issues (Table 11.1).

**Table 11.1:** Tools for identifying and categorizing issues (see [Toolkit](#) for more details).

Name	Description	Ease of Implementation
<i>Card storming (variation on brainstorming)</i>	Discuss issues and write the key ideas on cards; the facilitator then organises these ideas into clusters. Fosters inter-dependence, consensus and collaboration.	Easy
<i>Component trees</i>	Have the three EAFm components (human, governance & ecological) as headings, and categorise the various issues under each of the three headings and possible sub-headings. Break down each issue until it becomes manageable.	Moderate
<i>Problem tree</i>	A diagram that traces the causes, connectivity and cumulative effects of key problems	Moderate
<i>Asset/objective-impact/threat matrix</i>	A matrix that helps to separate identified issues into their two different categories – an “issue” describes a threat to, or impact on, what is desired to achieve.	Moderate
<i>Causal analysis</i>	Issues are sorted into a hierarchy of cause and effect starting with an overarching driver, then the root cause and proximate cause that results in the issue to be addressed.	Moderate



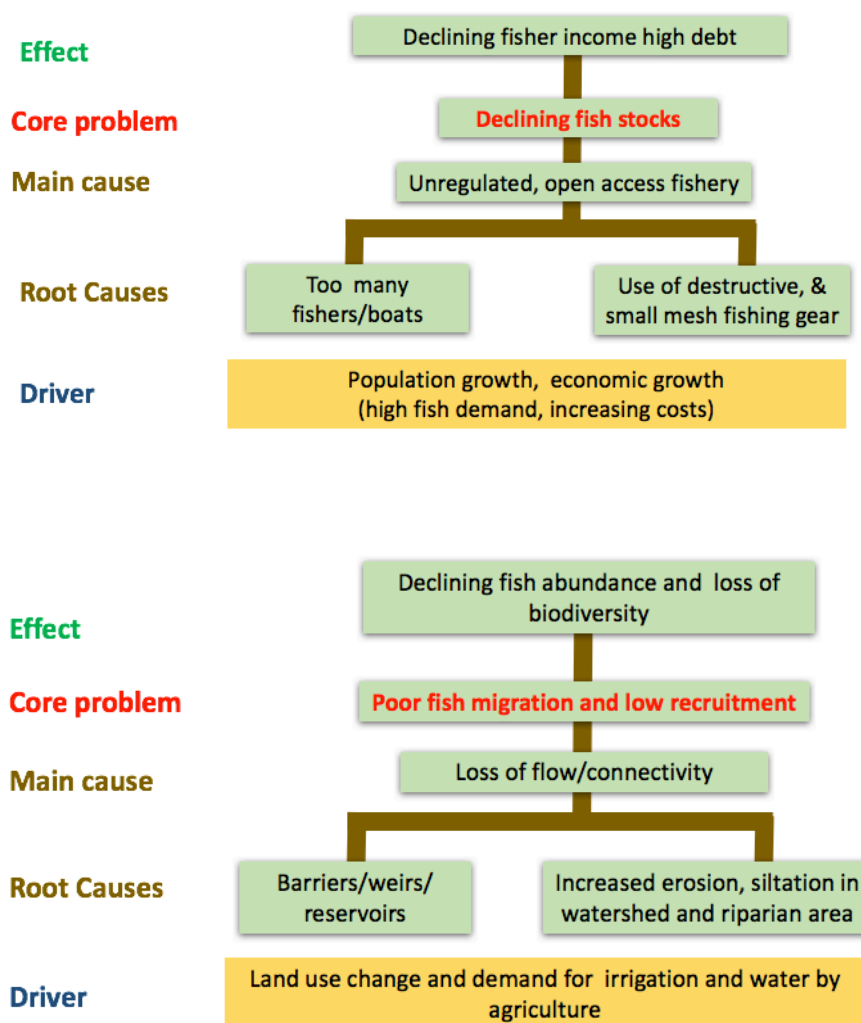
## CAUSE AND EFFECT

When threats and issues are identified through a participatory process it is usual for there to be a wide variation in the issues arising - some can be broad (e.g. pollution) and some are very specific (e.g. the use of illegal size gill nets).

A tool called a “problem tree” is one way to sort the wide range of issues identified ([Tool n.28](#)). The problem tree can recognise four levels of issues:

1. Drivers: these are large-scale events that have a flow-on effect on ‘downstream’ issues, e.g. growth in population and wealth, or climate change.
2. Effect: The effect that the core problem creates;
3. Core problem: the actual problem; and
4. Causes: the cause of the problem. These can be broken down further into main causes and underlying causes.

**Figure 11.1:** Two examples of problem trees. The first illustrates “declining fish stocks” driven by population and economic growth and the second, “poor fish migration and recruitment”, driven by loss of connectivity and impacts of water management



The overarching driver in the first case is that growth in population and wealth is leading to increased demand for fish. The effect that the declining fish catch has is on low income fishing families and is fueling high debt levels. The main cause of the problem is an open access ☺ policy that opens the fishery to anyone who wants to fish (in comparison to a limited access ☺ policy that restricts fishing to only those with a right to fish). As a result of the open access system, there are too many boats and non-selective fishing gears in operation (causes).

In the second case, the overarching driver is the demand for water by farmers for agriculture, which has leads to the creation of barriers and water control structures for diverting/abstracting water from rivers and is impacting on the flow of water onto or from the floodplain. The effect of these barriers is to break the connectivity of the river/floodplain system which negatively affects fish populations. The barriers also create bottlenecks where fish, often maturing adults) can be easily targeted by fishers leading to overexploitation of stocks.

### USING THE PROBLEM TREE

The problem tree helps identify threats and issues at a level that can be addressed by co-management ☺. The effect is often linked to the goal ([see later in this module](#)) and the core problem often identifies a co management objective ([Module 13 Step 3.1](#)). Causes can be addressed by management actions ([Module 14 Step 3.3](#)). This could either be a main cause or an underlying causes. In the first example, management actions could address the main cause by changing policy from open access to limited access. Actions could also address the fact that there are too many boats and that non-selective gears being used.

Some examples of issues, the problems that create them and the underlying drivers are presented in Table 11.2.

**Figure 11.2:** Some examples of problems that show the range of underlying causes and drivers of common problems in inland fisheries

Effects	Core problem(s)	(Main) Causes	Root causes	Drivers
<i>Conflict</i>	Increased fishing pressure outside protected areas	Lack of access to traditional fishing grounds	Establishment of protected areas without stakeholder participation	Inappropriate legislation and weak governance
	Inequitable distribution of benefits/fishing rights/access	Exclusion of fishers from access to water body	Management favours one subsector over the other	Inappropriate legislation and weak governance
	Lack of compliance with fishery management regulations	Capture of resources by an elite fisher group or individual	Inappropriate legislation	Inappropriate legislation and weak governance
<i>Loss of aquatic biodiversity and production</i>	Increased fishing pressure outside protected areas	Weak management and poor fisher buy-in	No participation in management decision and no consideration of traditional management practices	Top-down management/Fishing communities poorly organized
	Aquatic ecosystem impacted by infrastructure project developments	Lack of access to traditional fishing grounds	Establishment of protected areas without stakeholder participation	Inappropriate legislation and weak governance
	Fish stocks fished down	No EIAs or of poor EIA quality	Weak environmental regulation	Inappropriate legislation and weak governance
	Pollution and habitat destruction	Low catch per unit effort (CPUE)	Too many fishers in relation to the amount of resource available	Subsidies to fishers Open Access fishery
<i>Loss of biodiversity</i>	Rare species threatened with extinction	Informal activities not controlled or regulated	Weak environmental regulation	Inappropriate legislation and weak governance
	IUU/overfishing on broodstock or juveniles	Bycatch of rare species	Weak fishery management measures	Weak governance
<i>Reduced recruitment to fishery</i>		Use of illegal gears and non-compliance with management measures	Lack of efficient enforcement	Corruption
				Insufficient investment in fisheries management

Effects	Core problems	(Main) Causes	Root causes	Drivers
<i>Loss of aquatic biodiversity</i>	Decline or loss of migratory and riverine fish species	Loss of environmental flows	Water abstraction	Agriculture development/intensification
	Invasive species replace indigenous species	Loss of environmental flows	Construction of reservoirs	Expansion of urban/agriculture development
	Loss of floodplain species	Escape of exotic species from fish farms	Weak aquaculture regulation and management	Aquaculture development/intensification
	Cross breeding of wild relatives with aquaculture escapees	Introduction alien species	Weak environmental regulation	Recreational fishing
	Loss of large migratory species	Irrigation structures obstruct fish movements	Irrigation expansion/development obstruct fish movements	Agriculture development/intensification
	Poor water quality/hypoxia	Escape of indigenous species from fish farms	Weak aquaculture regulation and management	Aquaculture development/intensification
		Loss of longitudinal/latitudinal connectivity	Hydropower expansion/development obstruct fish movements	Urban/industrial development
		Eutrophication	Over-use of fertilizers, poor land management	Agriculture development/intensification
		Pollution discharge to aquatic ecosystems	Weak environmental regulation	Urban/industrial development
		Aquatic habitat loss including spawning grounds	Erosion and increased sediment load in rivers and lakes	Agriculture development/intensification
<i>Reduced fish stocks, decreased fish production</i>	Poor recruitment (from lack of breeding, low survival of juveniles)	Aquatic habitat loss including nursery areas	Draining of wetlands	Agriculture development/intensification
		Loss of lateral connectivity (ie. no access to nursery areas for fish)	Construction of dikes for flood protection	Expansion of urban areas/intensification of agriculture
		Loss of lateral connectivity (ie. no access to nursery areas for fish)	Construction of roads without or with inappropriate culverts	Rural development
		Riparian habitat loss	Construction on floodplains and on lake shores	Tourism development

Effects	Core problems	(Main) Causes	Root cause	Drivers
<i>Fishers have low net income</i>	Middlemen pay very little for the fish	Value chain inefficient	Fishing communities poorly organized	Low priority to development of fisheries sector
	Poor quality fish products	Lack of ice/fish storage	No ice plants due to lack of electricity	
	Low price for fish	Fish sold fresh without any processing	No skills to develop products	Global fuel price
	Operational cost of fishing is too high	High costs to reach fishing grounds	High fuel prices	
	Difficult to sell fish	Poor market access	Lack of road infrastructure	Low investment in rural development
	Low fish catches	Low catch per unit effort	Too many fishers in relation to the amount of resource available	Open Access fishery
	Storm damage, accidents and spoilage of catch	Lack of preparedness or risky fishing/post-harvest activity	Higher incidence of extreme weather events	Climate variability
	High dependence on fishing as a source of livelihood	Few alternative livelihood options	Landlessness	Population growth
	Low fish catches	Dwindling fish stocks, Collapse of the fishery	Increased fishing pressure	
	Many fishers become injured or die from work related accidents	Lack of safety gear, unsafe vessels	No investments in safety (equipment and capacity)	Low priority to development of fisheries sector
High dependence on fishing as a source of livelihood	Lack of employment opportunities	Weak rural economy	Low investment in rural development	
<i>Management measures inappropriate for SSF</i>	The status of fish stocks is unknown	Limited scientific knowledge on species most important for SSF and subsistence fisheries	Low investment in Fishery Management	
<i>Women and men have unequal livelihood opportunities</i>	Men and women treated differently	Gender assigned work opportunities and status	Cultural norms	

## ISSUE CHECK LIST

Regardless of the method used, it is important that all the issues affecting the FMU are considered. Here is a checklist (Table 11.3) that outlines the categories that should be considered and some examples. Some of these will not be applicable to every FMU, but deciding which issues are to be included is an important step that stakeholders involved with the EAFm process must take.

**Table 11.3:** Checklist of categories for issues relating to the FMU

<b>ECOLOGICAL WELL-BEING</b>	
<b>FISHERY RESOURCES</b>	
<i>Target/landed catch</i>	e.g. sustainability of main commercial or locally consumed species.
<i>Bycatch/non-target species</i>	e.g. discards; catch of unwanted, or endangered/vulnerable aquatic species.
<b>FISHING EFFECTS</b>	
<i>General ecosystem</i>	e.g. food chain impacts (removal of predators, loss of feed species)
<i>Habitat</i>	e.g. loss of riparian forest; impacts on aquatic vegetation
<i>Pollution from fisheries or fish processing</i>	e.g. poisons, untreated wastes entering water bodies
<b>ECOSYSTEM EFFECTS</b>	
<i>Impacts on water connectivity/flow</i>	e.g. dams and water storage, weirs and water control structures for irrigation and hydropower (also navigation to a lesser extent))
<i>Nutrient and sediment run-off</i>	e.g. especially from agriculture. Changing land use and deforestation.
<i>Pollution from other users</i>	e.g. urban/industrial effluents; aquaculture
<i>Invasive species</i>	e.g. introductions of aquatic species.
<b>HUMAN WELL-BEING</b>	
<i>Income, employment and livelihoods</i>	e.g. food security; gender-related access to/use of resources
<i>Safety and health</i>	e.g. product quality; safety at work
<i>Post-harvest</i>	e.g. market supply, a lack of capacity for adding value through processing
<i>Interactions with other sectors</i>	e.g. feed for aquaculture; competition for employment.

<b>GOOD GOVERNANCE</b>	
<i>Institutions</i>	e.g. lack of cooperation among relevant agencies; lack of management structures/mechanisms
<i>Limited consultation by other water users</i>	e.g. irrigation management, hydropower authorities
<i>Fishing communities</i>	e.g. lack of awareness of existing fishery rules and regulations
<i>Consultation/dialogue</i>	e.g. lack of participation
<i>Compliance and enforcement</i>	e.g. lack of enforcement capacity
<i>Information and knowledge</i>	e.g. uncertainty about stock status
<i>National economy</i>	e.g. changing market demand; rising prices

**Activity:** Agree on the set of threats and issues that are applicable to the FMU. Use a prople tree analysis to sort them into (i) Drivers, (ii) Effects, (iii) Core problems, and (iv) Causes

## 2.2 PRIORITIZE THE ISSUES THROUGH A RISK ASSESSMENT

Issue identification is likely to result in a long list of potential issues, but there is a practical limit to the number of issues that can be dealt with through a co-management system. Prioritization of specific issues is usually conducted using a risk assessment. The risk assessment can be either qualitative and opinion based, or highly quantitative and data based.

A risk analysis typically seeks answers to four questions:

1. What can go wrong? (Risk)
2. How likely is it to go wrong? (Likelihood)
3. What would be the consequences of it going wrong? (Impact)
4. What can be done to reduce either the likelihood or the consequences of it going wrong? (Action)

**Remember: risk = likelihood x impact**

High priority issues are those with a high likelihood of occurrence and high impact. These high priority issues are the ones that require direct management. A number of tools are available to prioritize issues (Table 11.4).

**Table 11.4:** Tools for prioritizing issues

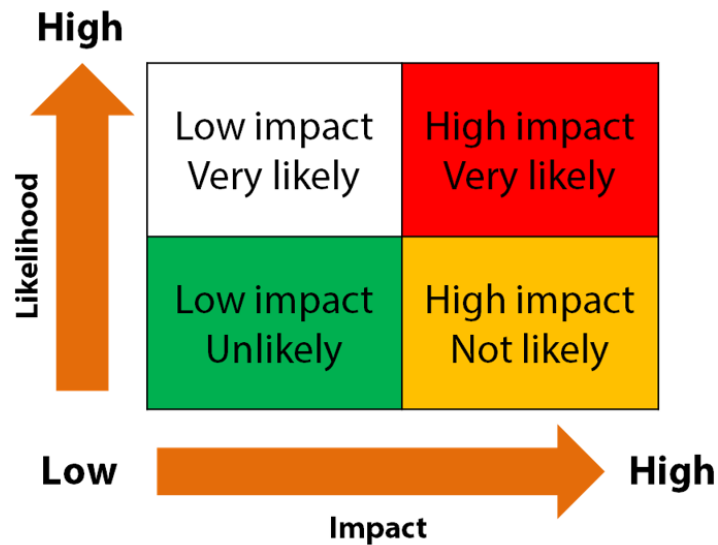
Name	Description	Ease of Implementation
<i>Non formal risk categories</i> <i>Semi quantitative risk assessment</i>	The risk associated with each identified issue is directly assigned by the participants to one of three categories – high, medium or low risk, with the descriptions incorporating the consequence and the likelihood.	Easy
<i>Qualitative risk analysis</i> <i>(impact/likelihood matrix)</i>	Participants place issues on the 2x2 matrix with two variables of likelihood and impact with two to six categories of likelihood and two to six levels of consequence (impact). Each identified issue is rated accordingly and plotted onto matrix.	Moderate
<i>Dot ranked informal vote ranking</i>	Participants identify issues which they think are high priority. Final count shows which issues are of high priority to that group of stakeholders.	Easy
<i>Pair-wise ranking</i>	Participants list up to five issues on cards on both vertical and horizontal axes of a matrix, in the same sequence. Compare each pair and agree which is the higher risk. Repeat until all possible combinations have been filled. List the results in rank order by sorting the cards in order of priority.	Easy

A simple semi-quantitative risk assessment is to rate each issue as to whether it has (i) high, medium or low likelihood of occurring and (ii) high, medium or low impact when it does occur. These are then plotted on a 2x2 matrix diagram Figure 11.2).

In this way, the high likelihood/high impact issues are identified. These are the high priority issues that need to be taken forward into the planning process. The medium risk issues might also be identified and mentioned in the EAFm plan in case their priority changes over time.



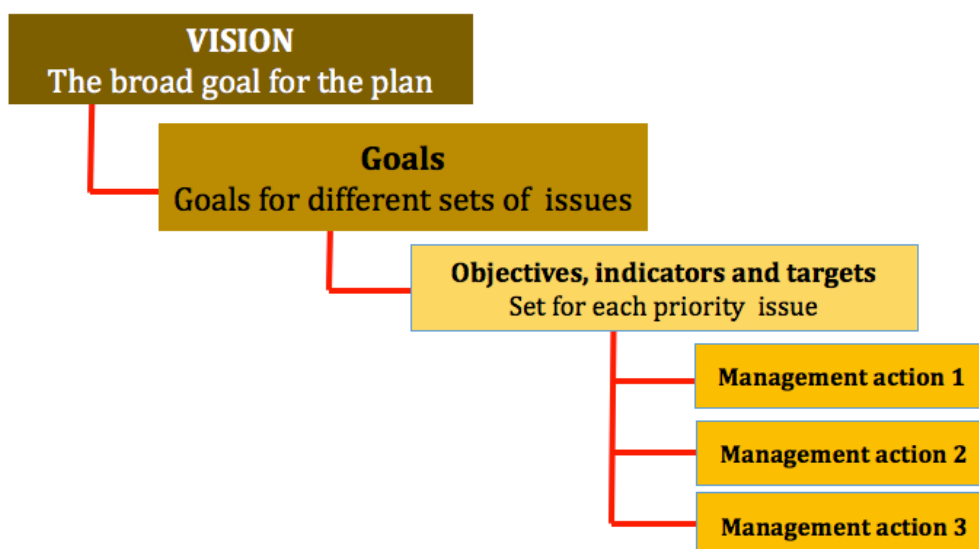
**Figure 11.2:** Semi-quantitative risk assessment. Likelihood is the probability of occurrence and impact is how change would occur.



**Activity:** Prioritize the issues using a 2x2 risk assessment and select the high priority issues and group them into the 3 EAFm components of EAFm.

### 2.3 DEFINE GOALS FOR THE EAFM

Remember the EAFm plan hierarchy:



As can be seen in the figure, 'goals' is nested under the vision and should still be broad and limited to three to five, for any EAFm plan. A goal is the long-term outcome that

management is striving to achieve. For example, the overall goal of a community-based co-management action may be to restore freshwater fish breeding habitats in a co-managed area. An objective is a formal statement detailing what you are trying to achieve for each goal (these are often referred to as management objectives) and are considered in the next step ([Module 13 Step 3.1](#)).

Examples of goals are:

- Restored and sustainably managed fisheries and other living marine resources and habitats;
- Improved livelihoods of communities that are dependent on the fisheries resources; and
- A well governed FMU with good compliance and enforcement.

It is often appropriate to consider at least one goal for each of the three components of EAFm. For the ecological well being component it is recommended that two goals be considered, one covering fishery resources and the other covering related ecosystem issues. This should help expand fisheries-centric thinking to the ecosystem scale.

**Activity:** Using the results of the problem tree analysis, put the Drivers aside as they are out of our control. Develop a goal for each theme (e.g. the 3 components of EAFm), by looking at the effects within each theme.

Finishing Step 2 allows the issues and goals to slot into the EAFm plan under the following headings:

EAFm PLAN FOR FMU [NAME]
<b>3. MAJOR THREATS AND ISSUES</b>
<b>Ecological issues:</b>
<ul style="list-style-type: none"> <li>• Fisheries resources and general environmental issues, including both the impact of the fishery on the environment and vice versa.</li> <li>• Water, aquatic resource use demands and issues</li> </ul>
<b>Social and economic issues:</b>
<ul style="list-style-type: none"> <li>• Issues relating to the people involved in fishing, the general public and at the national level, including gender issues.</li> </ul>
<b>Governance issues:</b>
<ul style="list-style-type: none"> <li>• Issues affecting the ability to achieve the co-management objectives.</li> </ul>
<b>4. GOALS OF MANAGEMENT</b>
Goals for each component (for different sets of issues)
<b>5. OBJECTIVES, TARGETS AND INDICATORS</b>
Objectives, targets and indicators for the fishery, covering:

- 
- fishery resources;
  - environment (including bycatch, habitats, prey protection, biodiversity, etc.);
  - social;
  - economic;
  - governance (ability to achieve the plan).

## **6. MANAGEMENT ACTIONS**

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Agreed actions for the plan to meet all objectives, (i.e, habitat protection, species conservation,. socio-economic benefits, good governance, etc), within an agreed time frame.

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Water-use agreements/agreements made with other departments or ministries...

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## **MODULE 12: REALITY CHECK I**

### **SESSION OBJECTIVES:**

- Identify the constraints and opportunities in meeting the FMU goals;
- Use facilitation skills with co-management partners in focus group discussions (FGDs);
- Use conflict management to resolve conflict in EAFm.

## OVERVIEW

This module allows the EAFm key stakeholder group to step back and assess what may stand in the way of the EAFm plan being realized. This may be the time to practice the facilitation skills discussed earlier in [Module 9 Startup B](#). This module discusses how to assess conflict so as to move towards consensus and explains the stages of conflict management. It then outlines strategies and techniques for dealing with conflict, including how to achieve, where possible, “win-win” (mutually beneficial) solutions.

## INTRODUCTION

At this stage of planning, the high priority issues that management can address have been identified and grouped under themes. Goals have been developed for each theme. It is now time to do a reality check to see if the goals are really achievable. This is called Reality Check 1. Further on in the process, after the EAFm plan has been implemented, another reality check – Reality Check II – will be carried out.

## CONSTRAINTS ON AND OPPORTUNITIES FOR ACHIEVING THE GOALS

Each goal needs to be reviewed to identify the constraints and opportunities for achieving it. To evaluate whether the goals are achievable, the EAFm team could ask the following questions:

### Relevant questions:

1. Is funding available or achievable to reach the goals?
2. Is there sufficient political support and stakeholder support?
3. Is there institutional support?
4. Is there sufficient human capacity?
5. Are the time frames realistic?
6. Can the information/data needs be met at a level where the precautionary approach allows for adaptive management?

If the answer to any of these questions is a definite “no”, then there are two options: either reset the goal to be more realistic, or work with stakeholders to try and remove the constraint, or at the least manage it. In some cases, constraints can be turned into opportunities.

**Activity:** Consider the constraints and opportunities in meeting the goals.

Planning tools are also available to evaluate whether the goals are achievable (see [Tool n.25](#)).

## FACILITATION AND FOCUS GROUP DISCUSSION

Many constraints can be overcome by involving the stakeholders in focus group discussions (FGDs). FGDs and the role of a facilitator were introduced in [Module 9 Startup B](#).

Remember the key ways to sustain stakeholder engagement are:

- effective facilitating that can be achieved by:
  - guiding people in a discussion of their experiences, feelings and preferences about a specific topic;
  - raising issues identified in discussions; and
  - the use of probing techniques to animate discussion and promote in-depth reflection.
- participants should be free to make their own questions, frames and concepts and develop their own priorities.

During this process, remember that interactions between participants provide opportunities to source and share data and information.

During a FGD, the facilitator is expected to:

- guide the session;
- not be too intrusive/structured in their approach;
- allow the discussion to flow freely;
- use a small number of general questions to guide the focus group session;
- refocus the discussion as necessary;
- intervene to bring out important issues if participants do not; and
- build rapport (use active listening).

**Activity:** Hold a focus group discussion.

## CONFLICT AND CONFLICT MANAGEMENT

Previous modules have demonstrated that an EAFm reflects the ecological, socio-economic and governance needs of a diverse range of sectors and stakeholders.

Given the extent and scope of the EAFm multi-stakeholder process, and the likely disagreements between different levels of resource users, some conflicts may be inevitable.

Conflict need not necessarily be negative, it can facilitate the emergence of more equitable power relationships, help correct bad fisheries management practices and improve EAFm implementation and fisheries policy.

Conflict over fisheries and aquatic resources can have many dimensions including, but not limited to, power, technology, politics, gender, age and ethnicity. Conflicts can take place at a variety of levels, from within the household to the community, regional, societal and global scales.

The intensity of conflict may vary from confusion and frustration over the direction that fisheries management is taking, to violent clashes between groups over resource ownership, access rights and management responsibilities.

Conflict often results from power differences between individuals or groups, or through actions that threaten people's livelihoods.

Conflict management is about helping people involved in conflict situations to develop an effective process for dealing with their differences. The generally accepted approach to conflict management recognizes that the parties in a dispute have different and frequently opposing views about a solution to a particular problem, but acknowledges that each group's views, from the group's perspective, may be both rational and legitimate. Thus, the goal of people working in conflict management is not to avoid conflict, but to develop the skills that can help people express their differences and resolve their problems in a collaborative way.

**Activity:** On the FMU maps, mark the areas where conflict is likely and who the players will be.

### MOVING FROM CONFLICT ASSESSMENT TO CONSENSUS

A first step in conflict management is to assess the specific conflict issue in question. An analysis of a particular conflict issue can provide insights into the nature, scope and stage of conflict, and possible approaches to its resolution through management. There are four main factors that should be analyzed when assessing conflict:

- **Characterize conflict and stakeholders.** Here the type and origin of the conflict encountered is analyzed, including the number of stakeholders involved, the balance of power among the parties and the relationships between them.
- **Stage in the management cycle.** Conflicts at the "beginnings" stage of EAFm are likely to be different from conflicts at the implementation stage. New stakeholders may arise as the EAFm process proceeds. This requires a flexible process that adapts to changing circumstances.
- **Stage in the conflict process.** Determine whether conflict is at a point at which interventions may be accepted.
- **Legal and institutional context.** The formal and informal institutions, (i.e. the rules of the game), the manner in which conflicts are resolved through these institutions and the formal legal doctrines that may influence an appropriate approach.

Conflict can be ignored (hoping it will go away), confronted (with the risk of deepening the disagreement), or it can be managed more positively.

One approach to conflict management is to hold multi-stakeholder analysis and consensus building meetings (**Tool n.4**). These meetings have the objective of fostering productive communication and collaboration, prior to the outbreak of conflict by employing tools such as conflict anticipation and collaborative planning, together with the cultivation of alliances and mobilization of support. Adopting a participatory co-

management approach to planning and implementing EAFm (as outlined in [Module 9 Startup B](#) and [Module 16 Reality check II](#)) will tend to support such a collaborative process.

Building consensus involves collaborative decision-making techniques, where a facilitator/ mediator assists diverse or competing interest groups in finding agreement on contentious issues, objectives or other matters where consensus is needed, as opposed to taking a majority vote. This usually involves sharing perspectives respectively and working together to seek mutual benefits. Ideally, it can be used before conflict actually emerges (thus reducing any need for later conflict management).

In EAFm, conflict management is useful at the stage of setting overall co-management goals and EAFm plan objectives, where reaching agreement on big issues will pave the way for agreement on smaller technical or institutional issues, as well as assisting in resolving conflict during the implementation of the EAFm plan.

### HOW TO USE CONFLICT MANAGEMENT IN EAFm

The goal of conflict management is to apply skills that help people express their differences and resolve their problems in win-win outcomes. Conflict management is basically a form of facilitated negotiation that works best under the following conditions:

- all disputing parties are known;
- there is a willingness to resolve issues;
- reaching an acceptable solution is important for all;
- parties trust the conflict management method;
- mutually beneficial solutions are possible;
- parties have the authority to make deals;
- funds, time and resources are available; and
- resolution is desirable in a wider context.

It is necessary to get past the symptoms and understand the root causes of the conflict (often from multiple sources) to be able to manage it. In the EAFm process, potential sources of conflict include:

- **relationships:** values, beliefs, prejudices, past injustices, past miscommunications;
- **information:** poor quality, misinformation, different interpretations;
- **interests:** perceived or actual, physical or intangible; and
- **structures:** resource flows, authority, institutions, time constraints, finances.

The stages in conflict management are:

1. **Initiation:** a stakeholder or outsider may invite help to manage the conflict;
2. **Preparation:** conflict assessment, information sharing, rules, participant selection;

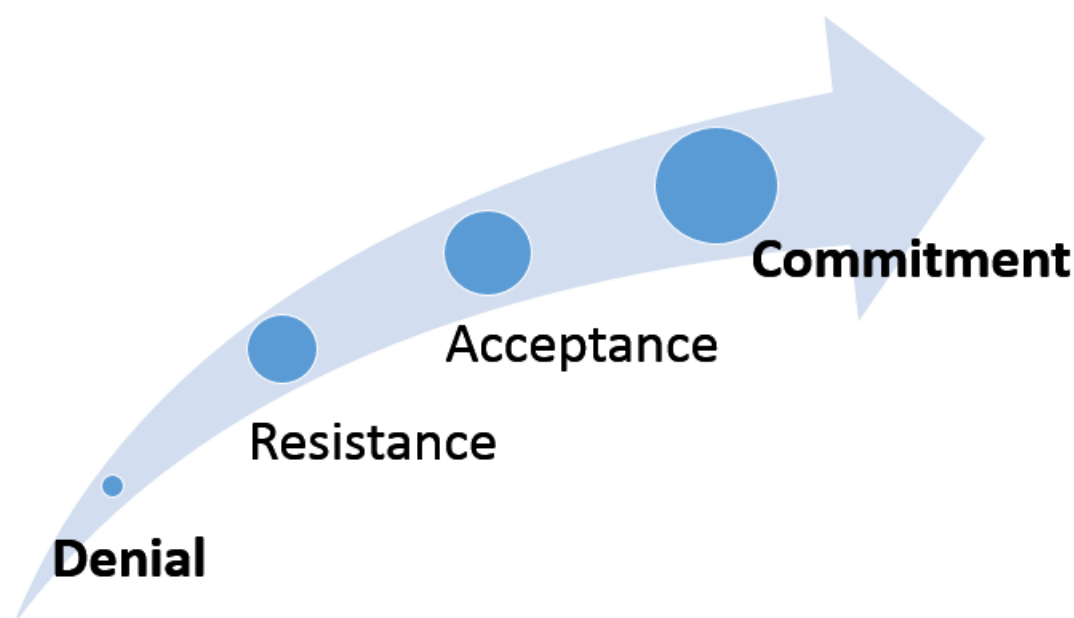


3. **Negotiation:** articulating interests and win-win options, packaging desired options;
4. **Agreement:** concluding jointly on best option package, recording decision making; and
5. **Implementation:** publicising outcomes, signed agreement (optional), monitoring.

### CONFLICT AS PART OF THE CHANGE PROCESS

Conflict should be viewed as an opportunity for change. Responses to change often follow the following stages: (i) denial, (ii) resistance, (iii) acceptance and (iv) commitment (Figure 12.1).

**Figure 12.1:** Conflict is a process of change that can have four stages.

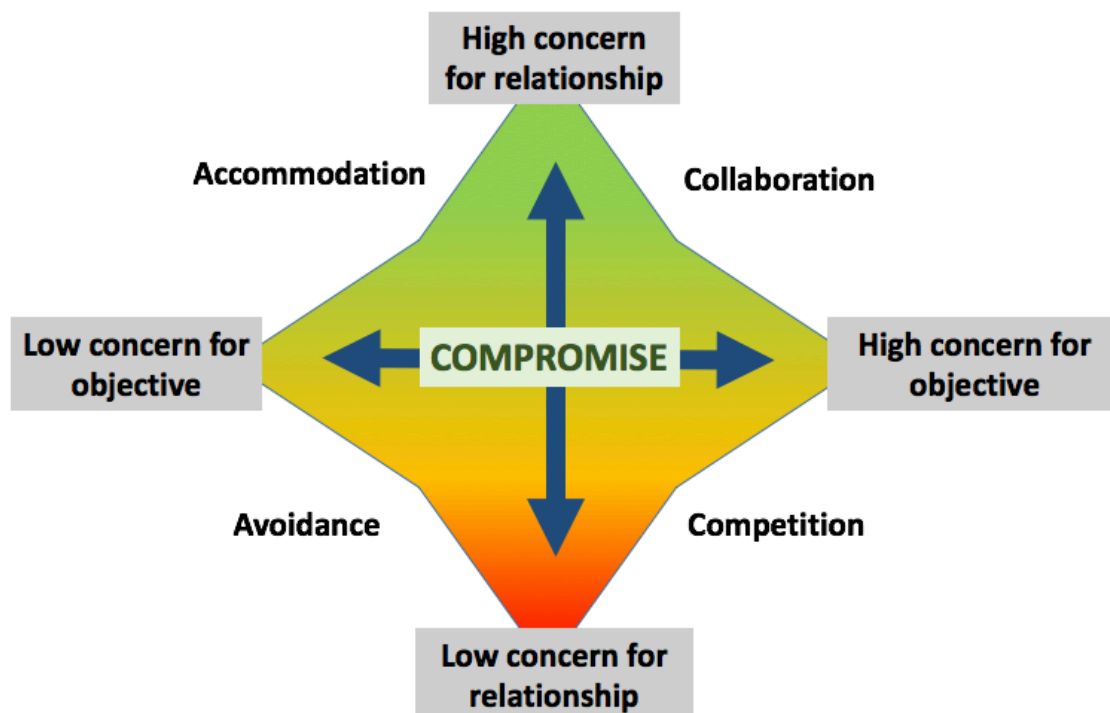


Conflict can be expected as part of the EAFm process of change. If the process is well managed, working through the conflict may lead to greater commitment towards the change. Use the strategies outlined below and conflict management tools ([Tool n. 8](#)) to assist with working through conflicts that might be encountered.

### STRATEGIES FOR DEALING WITH CONFLICT

Strategies for dealing with conflict can be categorized according to the strength of the desire to reach objectives and/or maintain good relationships (Figure 12.2).

**Figure 12.2:** Conflict strategies



If someone has a high concern for a relationship and a low concern for the objective, then that person is likely to accommodate a proposed resolution. If someone has a low concern for a relationship and a low concern for the objective, that person will likely go for an avoidance strategy.

When stakeholders value the objective more than the relationship, they will tend to compete. Compromise occurs when someone “gives up” some of what they wanted in order to reach an agreement that suits all parties.

If someone values the relationship and objective equally, they may be receptive to collaboration, i.e. win-win solutions. Table 12.1 below explains these five strategies for dealing with conflict in more detail.

**Table 12.1:** The five strategies in dealing with conflict

APPR OACH	BEHAVIOUR	JUSTIFICATION
<i>Avoidance</i>	Non-confrontational. Ignore issues. Deny they are a problem.	Afraid of damaging relationships or creating even greater problems.
<i>Accommodate</i>	Agreeable, non-assertive behaviour. Cooperative, even at expense of personal goals.	Afraid of damaging relationships and creating disharmony.
<i>Compete (win/lose)</i>	Confrontational, aggressive. Must win at any cost.	Survival of fittest. Must prove superiority.

APPROACH	BEHAVIOUR	JUSTIFICATION
<i>Compromise</i>	Settle for middle ground. Satisfies no one completely, but everybody gets a part of what they wanted.	No one wins everything they want, but everyone wins something.
<i>Problem-solving collaboration (win-win)</i>	Needs of both parties are important. High respect. Mutual support. Assertive/cooperative.	Mutually beneficial solution can be found.

## ACHIEVING WIN-WIN SOLUTIONS

When trying to achieve a solution(s) to a conflict situation that will work for all parties, it is a good strategy to think of potential opponents as problem-solving partners.

Here is a process that can be used when mediating between stakeholders in conflict:

1. Set the scene: "Let's find a way to solve this that works for everyone".
2. Define problem in terms of needs/outcomes. Define the original problem and individual needs, as well as expected outcomes. Identify the shared (relationship) needs.
3. Brainstorm possible solutions.
4. Evaluate the solutions.
5. Choose solutions.
6. Plan what action will be taken.
7. Evaluate results.

## CONFLICT MANAGEMENT TECHNIQUES

- The use of **suggestions** rather than proposals encourages flexibility and movement, and encourages building on ideas in order to reach agreement. (Not "We need to do it this way!" but "What if we try to use this approach?")
- Be **assertive**, not aggressive or passive, to take emotions out of the situation; assertive behaviour can be especially useful for dealing with anger or aggression by slowing down perceptions so that you "respond" rather than "react". (Not "I'm the manager here!" but "We need to think this through from the start.")
- **Avoid "you" statements.** "I" or "we" (not "you") statements are less likely to be seen as personally critical; avoiding "you" statements can assist this through a more sensitive approach based on mutual interests. (Not "You're wrong!" but "I think we should try to use another approach.")
- **Anticipate reactions** proactively to plan and prepare your approach to conflict; ("I know you're very busy, but we could really use your help on this.") Anticipation of the other person's feelings and awareness of their reactions helps to create a more positive climate in which to respond and encourage responses rather than reactions.
- **Consider the other person's interests** to make your comments more relevant;

(“I realise this is our problem not yours, but a good solution can help you too.”)

- **Acknowledge reactions** detected through body language or expressions; (“I can see that you don't think much of this approach, so let's talk about it.”)
- **Apply limit setting** to clarify responsibilities and create limits for decisions; limit setting is useful to clarify priorities, particularly when organizational authority applies (i.e. the decision is not your own). (“Please get it to me by Monday” or “the department needs the figures for the year end.”)

The first six conflict management techniques concentrate on this critical area of converting emotional reactions into more flexible responses. Everyone has personal views, feelings and emotions that influence the way they respond to others in conflict situations.

Those managing the EAFm process need to be sensitive to personal factors in both themselves and the other stakeholders' interests. This may sound difficult now, but it will certainly increase management effectiveness.

## CHARACTERISTICS OF ASSERTIVE COMMUNICATION

Being assertive is very culturally dependent. What is acceptable in certain countries may be considered rude or inappropriate in others. The characteristics listed below therefore need to be adapted to the region and culture in which the EAFm process takes place:

- speaking in short, direct sentences;
- using phrases such as “I think,” “I believe,” and “in my opinion” to demonstrate taking responsibility for thoughts;
- asking others to clarify their statements when there is uncertainty around their meaning;
- describing events objectively rather than exaggerating, embellishing or distorting;
- maintaining direct and extended eye contact (in certain cultures only, e.g. western culture).

## TIPS FOR EAFM MANAGERS

- Agree objectives through consultation with the stakeholders. Ensure all concerned share the FMU's vision (broad goal).
- Divide responsibilities and resource entitlements carefully to minimize conflict. People with identical objectives who share resources are likely to compete against each other. Enable and encourage stakeholders with complementary objectives to work in co-operation with each other.
- Create opportunities for relationship building and make interdependencies between different departments or agencies explicit. This will encourage tolerance and collaboration when difficulties arise.
- Recognize staff and partners who demonstrate that they value supportive working relationships.

**Activity:** Win-win solutions role play

**Consultation Tools:** <http://www.fao.org/fishery/eaf-net/topic/166247/en>

## **MODULE 13: STEPS 3.1 & 3.2 DEVELOP OBJECTIVES, TARGETS AND INDICATORS**

### **SESSION OBJECTIVES:**

- Develop management objectives;
- Develop targets and indicators and related to the objectives.



## OVERVIEW

This module outlines how to develop management objectives, and from this how to develop targets and indicators. It also briefly discusses data and information needed for indicators, and reiterates the importance of stakeholder participation in these key activities.

## INTRODUCTION

After identifying the FMU goals for each EAFm component, and the issues that require direct intervention, the next step is to develop a management system that will deliver successful outcomes. This requires clearly determining what is to be achieved for each issue in the fishery – the objective – what can be measured to assess whether the objective is being achieved, and which management actions are going to be used.

The first thing to do is to develop objectives for the high-risk issues (high likelihood/high impact) that are clear, measurable and directly linked to one or more of the higher level goals. These are the management objectives that are at the core of the EAFm plan. Some medium-risk issues might require identification of a mechanism in the plan for on-going review and some form of contingency plan. Low-risk issues might be noted in the plan, explaining why they are considered low risk.

### 3.1 MANAGEMENT OBJECTIVES

Using the high priority issues identified in Step 2.2, it should not be difficult to create an objective directly from the issue. The objective needs to state what will be achieved, e.g. “improve the connectivity of a wetland to increase fish production”. Stakeholders will also need to decide on how they will assess whether the objective is being achieved. This is done through setting targets and indicators. In practice, it should be possible to estimate the indicators from data that have or could be collected, but this should not exclude an indicator for which new data are required. Indicators should be developed only after an objective has been agreed to (See [Tool n.30](#) for examples).

**Relevant questions:**

For each issue that is to be directly managed the following relevant questions apply:

- 1) What are the management objectives relevant to this issue and what specifically should the fishery be trying to achieve for this issue?
- 2) Are any of the objectives for the issue in conflict with each other, if so what is the order of priority?
- 3) Is there stakeholder agreement on the objectives?
- 4) Are the agreed set of management objectives and outcomes for the issue still consistent with the high-level goals, other policies, treaties, legislation, etc.?

**KEY ACTIONS**

- For each issue requiring direct management, identify possible management objectives.
- If there is more than one management objective for an issue, determine their hierarchy or relative priority.
- Obtain stakeholder input or advice on their appropriateness and practicality.
- Review management objectives to ensure they are consistent with high-level objectives, legislation or policies.
- Confirm the set of management objectives that will be used for developing the management system.

For an EAFm plan, if issues are specific it will be easier to introduce management actions and interventions. For example, within the broad objective:

*“Manage the main commercial species within ecologically viable stock levels by avoiding overfishing and maintaining and optimizing long-term yields”*

*There may be two related management objectives:*

*“Prevent spawning stocks declining to a level that impairs recruitment”; and*

*“Minimize the number of juvenile fish being taken”.*

As it is sometimes difficult to develop management objectives without also identifying the relevant indicator, the target and the baseline from which you are moving. It is better to think of these elements as a package. So, objectives and their relevant indicators, targets and baselines need to be worked out together.

**3.2 TARGETS AND INDICATORS ☺**

Stakeholders also decide on how to assess whether the objectives are being achieved. This is done through setting targets and indicators that measure management performance to determine whether management is meeting the objectives.



## WHAT IS A TARGET?

Put simply, the target describes where you want to go relative to where you came from (baseline) and where you do not want to be (limit).

Targets can specify the desired state of the indicator (e.g. 20 percent of area within a fish conservation zone), or limits that specify a boundary within which to operate, or that should not be exceeded (e.g. effort should not exceed 50 percent of existing fishing effort). In fisheries jargon, these are often referred to as target and limit reference points.

It is always desirable to set targets using a precautionary approach which involves setting reasonable levels and taking firm actions when these are approached or exceeded.

## WHAT IS AN INDICATOR?

An indicator measures the current status at one point in time (e.g. catch, temperature, areas of flooded forest, etc.).

An indicator can be a quantitative or qualitative measure of some attribute of the fishery that is:

- **DIRECT:** directly measured (e.g. number of fishers using a specific gear);
- **ESTIMATED:** estimated using a model (e.g. biomass estimated using a stock assessment model);
- **INDIRECT/PROXY MEASURE:** measured indirectly (surrogate measures of biomass such as catch rates, or applying average CPUE to the number of fishers, or
- **INFERENCE:** just inferred (e.g. number of collaborative meetings as an indicator of cooperation and coordination across agencies).

More than one indicator may be used to monitor performance of the same management objective (e.g. both fishery-based and fishery-independent biomass estimates). This can provide greater confidence where none are considered accurate alone, but requires determination of how they will be collectively interpreted to track performance when they show differing trends.

Triangulation using similar indicators can provide more confidence that management objectives are being reached or otherwise.

Participatory, community-based monitoring can be used to develop and monitor suitable indicators that are based on locally collected data. This can provide a practical and cost effective method to measure progress towards meeting the management objectives developed for EAFm. For more details on how participatory community-based monitoring can be integrated into the EAFm process see EAF-net website ([Activity 3.2](#) and [Tool n.38](#)).

Where the risks are low, crude indicators may be adequate. When selecting indicators, the level of complexity and the precautionary nature of the management action must also be considered. Where the inherent risks are higher, or the management approach is more aggressive, more robust and precise indicators will be needed. The alternative is for management to be more precautionary with appropriate adjustments made to the acceptable performance limits.

**Relevant questions:**

- 1) Is there already an indicator being used?
- 2) What levels of the indicator define acceptable performance for the objective and why?
- 3) How precise or robust does the indicator need to be to match the risk profile of the fishery?
- 4) What resources are available for indicator measurement?
- 5) Would the cost of moving to a more robust indicator be worth the additional expense?
- 6) Are the resources sufficient to maintain the indicator system as long as needed - are the proposed indicators compatible with the monitoring and evaluation capacity available?
- 7) To what degree should the target-indicator management system be formalized?
- 8) Is it appropriate to generate control rules?

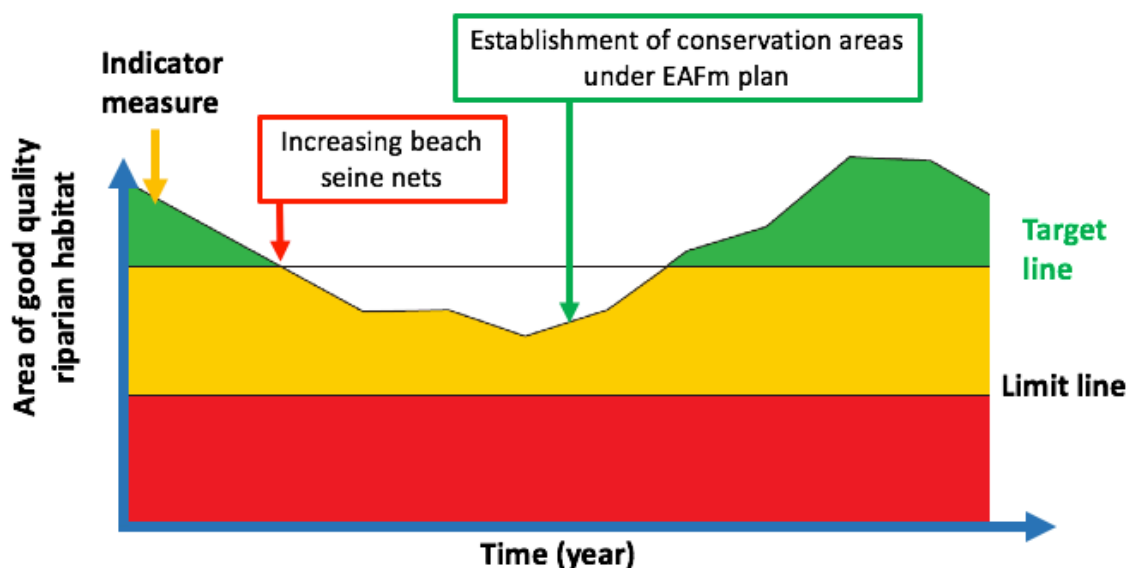
**KEY ACTIONS**

- Identify possible indicators to measure performance for each management objective.
- Agree on the level of precision and accuracy required.
- Review what data/information are available and the relative costs for each possible indicator given their relative uncertainty.
- Determine the most cost effective options.
- Given the levels of uncertainty in the indicator, determine what will signify acceptable and unacceptable performance.
- If more than one indicator is to be used for the objective, determine how they will work together to determine the assessment outcome.
- In practice it should be possible to estimate the indicators from data that have been or could be collected.

## MEASURING MANAGEMENT PERFORMANCE

Comparing the indicator with a target, baseline or limit, provides a measure of how well management is performing ([Module 17 Step 5](#); (Figure 13.1).

**Figure 13.1:** Measuring management performance: trend of an indicator shown against target and limit.



*Note: Green is the desirable outcome (above the target), orange is less desirable (below the target but above the limit, and (iii) red is undesirable.*

## DATA AND INFORMATION NEEDS FOR INDICATORS

Indicators need to be **SMART**:

- **S**pecific (in terms of quantity, quality and time);
- **M**easurable (objectively verifiable at acceptable cost);
- **A**vailable (from existing sources or with reasonable extra effort);
- **R**elevant (to objectives and sensitive to change); and
- **T**imely (to ensure usefulness to managers).

Data and information needs were discussed in [Module 10 Step 1.3 Scope the FMU](#). The same considerations apply to data and information for indicators and monitoring. Data needs are guided directly by the indicators selected and therefore data related to ecological and human well-being as well as governance will be needed. The collection of new data will likely be necessary and participatory approach to data collection should be encouraged.

**Relevant questions:**

- 1) Who is responsible for measuring the indicator(s)?
- 2) Where do the data come from (new or existing)?
- 3) If new, what method will be used?

It is also good practice to carry out data validation. Specifically, a combination of different types of qualitative and quantitative data collection methods and sources should be used. This will provide a more complete analysis of the subject matter – can enhance credibility of evaluation conclusions and generate confidence in the recommendations.

**PARTICIPATORY MONITORING AND EVALUATION**

Where possible, participatory monitoring and evaluation (M&E) ☺ should be used to collect data. Participatory M&E focuses on who measures change, who benefits and how concerns are negotiated, specifying what to measure as indicators and setting targets and limits. The composition and skills of the assessment/M&E team are very important. Note that the assessment/M&E team may be the same or different from the EAFm team.

**Activity:** Develop management objectives, targets and indicators for a selected number of high priority issues.

As part of the overall EAFm plan, the objectives, targets and indicators slot into Section 5 of the EAFm plan under the following headings:

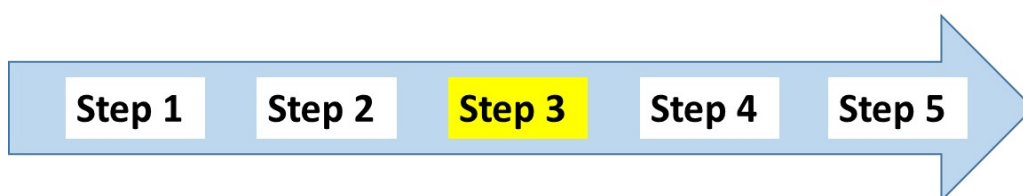
EAFm PLAN FOR FMU [NAME]
<b>5. OBJECTIVES, TARGETS AND INDICATORS</b>
<p>Priority issues, objectives and targets for the fishery, covering:</p> <ul style="list-style-type: none"> <li>• fishery resources;</li> <li>• environment (including bycatch, habitats, prey protection, biodiversity, etc.);</li> <li>• social;</li> <li>• economic;</li> <li>• governance (ability to achieve the plan).</li> </ul>



## **MODULE 14: STEPS 3.3, 3.4 & 3.5 MANAGEMENT ACTIONS, COMPLIANCE, FINANCE AND FINALIZE EAFm PLAN**

### **SESSION OBJECTIVES:**

- Identify management actions and how stakeholders will comply with these;
- Include financing mechanisms in the plan;
- Bring it all together – finalize the EAFm plan.



## OVERVIEW

This module completes Step 3. It explains how to agree on management actions and focuses in particular on how to ensure compliance with these agreed actions. The module also discusses financing issues and concludes with how to finalize the EAFm plan.

## INTRODUCTION

Having determined the set of management objectives, targets and indicators for the fishery, the next step is to produce an agreed and coherent set of management actions that will address the priority issues and meet the specified objectives.

## MANAGEMENT ACTIONS

### THE MANAGER'S TOOLBOX

In existing fisheries management, the focus is often on managing people to promote sustainable use ☺ of fisheries resources. For example, technical actions may control the type of fishing gear used and impose closed seasons to protect spawning stocks. In EAFm, because the issues and objectives being considered are broader, an expanded suite of management actions may be required. These can include: (i) conventional fisheries management actions to address target species concerns; (ii) actions to maintain, restore, and conserve the structure and functions of the ecosystem; (iii) actions that address human social/economic dimensions; and (iv) actions to address fisheries and natural resources governance issues.

**Table 14.1:** Typical EAFm management measures/actions

Measure	Examples
<i>Technical measures to regulate fishing mortality (e.g. control gear type);</i>	Catch and effort controls: <ul style="list-style-type: none"> <li>input controls (e.g. limited entry, gear capacity limits, fishing location limits, traditional use rights)</li> <li>output controls (e.g. protected species.)</li> </ul>
	spatial controls (e.g. area closures, fish conservation zones (FCZ) ☺ and no-take areas);
	temporal controls (e.g. seasonal closures; protecting spawning aggregations);
<i>Ecosystem manipulation</i>	Habitat modification, (planting riparian habitat),
	Restoration of connectivity, instituting environmental flows
	Stock population manipulation, such as restocking, stock enhancement

Measure	Examples
<i>Community-based development</i>	Income diversification e.g. promoting alternative livelihoods
	Human capacity development: e.g. Community organisational skills
<i>Working with others</i>	Cooperation with irrigation departments
	Negotiation with hydropower operators for water discharge volumes and frequencies.
	Integrated Watershed Management (IWM)
	Environmental Agency

See Manager's Toolbox [Tool n.33](#) for a “work- in-progress” template of management actions as well as [Tool n.35](#) for management actions specifically for alternative livelihoods.

Some of the EAFm issues and objectives may fall outside the mandate of a fishery agency. In these cases, EAFm needs to link to additional management sectors, such as irrigation management, watershed management, disaster risk reduction and climate change adaptation ☺.

EAFm management actions can include management plans and actions undertaken through other management strategies (e.g. IWM, FCZs, integrated landscape planning) when they meet the EAFm management objectives.

## OVERLAPPING ACTIONS

In most cases, there will be several management actions that could partly address a particular objective and a list of these can be assembled through brainstorming sessions with members of the target community, assisted by the key stakeholder group and relevant government agencies. Community engagement tools such as the problem tree ([Tool n.28](#)) can be used to encourage community members to propose management actions that could solve particular problems. For each objective, it is useful to prepare a list of all possible management actions with particular attention given to their ease of application, likelihood of success, feasibility and cost.

As a result, unlike some fishery management processes that introduce interventions without first setting objectives, it should be clear to all stakeholders why a particular management action is being introduced. All co-management actions must include reference to those responsible and the time frame required for implementation. Different co-management actions will be the responsibility of the community, the promoting agency, or other agencies.

## DECISION OR CONTROL RULES

Where possible, the use of specific co-management actions should be accompanied by decision rules on how they will be applied. In practice, this is often developed later in the process. The decision rules state the actions to be taken under different conditions, as determined by the performance indicators. In a small-scale fishery context these actions need to be pragmatic (e.g. relating to stricter enforcement if a particular action is not working).



The key is to try and agree on what might happen and how to react to any change in indicator value. This provides a degree of certainty for the stakeholders. It is essential that the decision rules are widely known and understood. In certain cases, decision rules can be quantitative (e.g. changing the duration of a community fishery close season as pre-specified fractions of abundance, determined by an assessment of catches made by fishers in the community) or, qualitative where, for example, a certain value of an indicator triggers a decision to conduct a review of co-management.

## MANAGEMENT ACTIONS AND THE RULES AND REGULATIONS

It is good practice to develop a set of rules and regulations as a companion document to the EAFm plan. As the EAFm plan is intended as long-term reference (albeit with regular adaptations and changes), management actions in the EAFm plan should be fairly generic e.g. limiting the mesh size of gill nets, or establishing a closed area or period.

The exact specifications of this action are best set out in the rules and regulations (e.g. minimum mesh size = 5cm; closed season of 4 weeks from June 1st). This is because it may be easier to change the decision rules and regulations, than the EAFm plan itself (although this depends on how the EAFm plan is formalized **Module 15 Step 4**).

Rules and regulations can be formal or informal, indeed those made by communities for their EAFm plan may prove to be more effective than top-down laws and rules, if there is good community buy-in.

## COMPLIANCE AND ENFORCEMENT

There is no point in developing co-management actions unless there is some way to ensure compliance with the actions.

Compliance and enforcement are different but complementary concepts.

Compliance is achieved when fishers' actions conform to the relevant regulations and legislation, whereas enforcement is the act of enforcing or ensuring observance of and/or obedience of rules and regulations. Compliance is the outcome of voluntarily acceptance of, and action in accord with, the co-management rules and regulations.

Enforcement is the action taken against stakeholders when rules and regulations are broken. . The task of balancing compliance with enforcement requires that resource managers should make compliance a preferred outcome compared to enforcement.. Any compliance and enforcement system should be transparent, accountable, legitimate, equitable and flexible. Compliance is best achieved when fishers perceive that co-management is being legitimate and fair; the science as being reliable and trustworthy; where there are effective monitoring, control, and surveillance activities and effective penalties to decrease economic incentives for violations are in place.

Enforcement systems attempt to increase compliance with rules governing resource use, by monitoring user behaviour and punishing those engaged in prohibited activities. By increasing the severity and likelihood of sanctions and, thus, raising the opportunity cost of non-compliance, enforcement systems act directly upon resource users to foster

adherence with established rules. Enforcement systems also shape compliance indirectly.

By shaping perceptions of overall compliance rates, enforcement systems affect rates of “contingent compliance,” where individuals base their decision to obey rules upon the (perceived) rate of compliance by others. Through both the design of sanction mechanisms and the perceived “fairness” of enforcers, enforcement systems also shape perceptions of legitimacy.

### **MONITORING, CONTROL AND SURVEILLANCE (MCS) ☺**

In fisheries jargon, the enforcement of, and compliance with, management actions is known as “Monitoring, Control and Surveillance (MCS).” MCS is the mechanism for implementing agreed management actions. The components of MCS comprise:

1. **Monitoring (M)** – the collection and analysis of information relevant to compliance;
2. **Control (C)** – the rules by which the fishery is governed; and
3. **Surveillance (S)** – observing and policing to ensure compliance with the fishing rules.

Note that this use of the word “Monitoring” has a different scope to that used in the term “Monitoring and Evaluation (M&E)”. Monitoring for compliance can be thought of as a specialized subset of the larger monitoring for M&E.

Monitoring for compliance includes collecting information on what is happening in the fishery.

Control is the rules under which fishery resources can be harvested, as stipulated in national fisheries legislation, EAFm plans and other arrangements (i.e. traditional law).

Surveillance involves the regulation and supervision of fishing activity to ensure that fishing rules and management actions are observed. This activity is critical to ensure that the fishery is not over exploited, poaching is minimized and co-management actions are implemented.

This provides the basis on which fisheries management (via MCS) is implemented

MCS needs:

- Cooperation and coordination across communities and agencies;
- Stakeholder “buy-in”;
- Training and resourcing;
- Education and awareness raising; and
- Policing, prosecuting and sentencing or sanctioning by communities.

### **TOP-DOWN AND BOTTOM-UP COMPLIANCE AND ENFORCEMENT**

Enforcement can be “top-down” (i.e. fishery patrol enforcement) and/or “bottom-up” (i.e. local fish wardens and through co-management). Whilst the national and local governments have responsibility for law enforcement, the enforcement of regulations by fishers is increasingly common when governments are short of MCS financial or human resources.

In some cases, fishers are deputized to undertake enforcement, while in other cases they can be provided with a telephone number “hotline” to call and report illegal activities. Mobile phone cameras are now routinely used by fisher groups, for documenting illegal activities. Resource users may also decide to self-enforce regulations when they believe that they benefit from compliance with regulations.

Ideally, self-enforcement should be formally empowered by agreement with responsible government agencies so that it is legitimate, otherwise there is the danger that self-enforcement takes on a form of vigilantism.

Enforcement is more than the presence of armed police having the authority to arrest people; it involves the application of a broad range of approaches by different institutions and stakeholders to change or modify behaviour. Enforcement interventions can be 'soft' preventive measures or 'hard' sanctions.

Soft enforcement approaches promote voluntary compliance with the requirements of the law without going to the courts. Soft enforcement focuses on the social and cultural dynamics of compliance that can be used to: (a) sustain widespread compliance, (b) encourage voluntary compliance, and (c) achieve general deterrence.

#### **Soft or positive approaches include:**

- Social marketing;
- Social mobilization;
- Aquatic resource management best practices;
- Legislation and regulation;
- Information management and dissemination;
- Education and outreach; and
- Monitoring and evaluation.

Negative or 'hard' enforcement uses legal sanctions imposed by a court or regulatory authority for deterrence. Hard enforcement approaches have one objective, which is to identify, locate and suppress the violator using all possible instruments of law.

#### **Negative or hard approaches include:**

- Continuous presence of law enforcers/ fishery inspectors;
- Consistent activities to detect, apprehend and prosecute violators and impose appropriate sanctions;
- Sophisticated strategies developed to apprehend repeat violators; and
- Negation of all economic benefits from illegal activities.

Enforcement requires consultation and coordination among the various agencies and organizations with responsibility for enforcement of regulations, monitoring, surveillance, apprehension and sanctions. This may include the Police, fishery enforcement patrols and community-based enforcement units.

Actions to foster compliance with the co-management rules and regulations will change over time. In the initial phase of management, there may need to be an emphasis on public education and outreach, and visible enforcement processes to help stakeholders become familiar with new boundaries and regulations.

As the benefits of co-management become understood, stakeholders will quickly develop a sense of “ownership” of, and a commitment to the success of the co-management. At this point self-enforcement can strengthen to wilful compliance, through the threats of social sanctions and peer pressure.

See [Tool n. 34](#) for ways to improve MCS.

## FINANCING OF THE EAFm PLAN

As for any other plan, developing the EAFm process will require consideration of the required budget and other sources of funding to support the process. [Module 8 Startup A](#) explained that secured funding to embark on the EAFm process was needed. Funds must be available to support the various activities related to planning, implementation, coordination, MCS and M&E of the plan. It is good practice to plan yearly budget lines for each of these activities as part the EAFm plan and implementation work plan (see [Module 15 Step 4.1](#)).

Funding, especially sufficient, timely and sustained funding, is critical to the sustainability ☺ of the EAFm process. In the early stages of implementation, funding may have been obtained from an external donor organization or a development project. This source of funding may or may not continue in the long run. Programmes often fail when this outside source of funding stops; it is therefore essential to put in place alternate sustainable financing mechanisms early in the EAFm process. Funds also need to be made available on a timely basis to maintain cash flow for critical expenses such as staff salaries and co-management activities. The EAFm process should be supported and accepted by the community so that stakeholders will become confident enough to invest their own time and funds.

### Relevant questions:

- 1) Is funding available from existing budget or are new sources required?
- 2) What is the existing budget and budget cycle?
- 3) Who will/can pay?
- 4) What are the equity issues and the impacts on stakeholders?

The choice of which financing mechanism(s) to utilize in a particular case should be based on analysing several feasibility factors:

- financial (funding needed, revenue generation, revenue flow, year-on-year needs);
- legal (legal support for financing mechanism, new legislation needed);
- administrative (level of difficulty to collect and enforce, complications and costs; potential for corruption, staff requirements);

- social (who will pay, willingness to pay, equity, impacts);
- political (government support, monitored by external sources); and
- environmental (impact).

**Table 14.2:** Depending on the situation, and government support, several sources may be available

REVENUE TYPE	SOURCE OF REVENUE
<i>Government revenue allocations</i>	<ul style="list-style-type: none"> <li>• Direct allocations from government budget;</li> <li>• Government bonds and taxes earmarked for conservation; and</li> <li>• Debt relief.</li> </ul>
<i>Community funds</i>	<ul style="list-style-type: none"> <li>• Community fisher organisational membership fees</li> <li>• Informal fishing rights sold to outsiders wishing to fish in co-management areas</li> <li>• Stakeholder savings funds for livelihood diversification</li> </ul>
<i>Grants and donations</i>	<ul style="list-style-type: none"> <li>• Bilateral and multilateral donors' grants;</li> <li>• Foundations;</li> <li>• Non-government organizations;</li> <li>• Private sector; and</li> <li>• Trust funds.</li> </ul>
<i>Tourism revenues</i>	<ul style="list-style-type: none"> <li>• Fees (entry, yachting, angling, eco-tourism);</li> <li>• Tourism-related operations of management authorities; homestays</li> <li>• Hotel taxes;</li> <li>• Visitor fees and taxes; and</li> <li>• Voluntary contributions by tourists and tourism operators.</li> </ul>
<i>Real estate and development rights</i>	<ul style="list-style-type: none"> <li>• Purchases or donations of land and/or underwater property;</li> <li>• Tradable development rights and wetland banking; and</li> <li>• Conservation concessions.</li> </ul>
<i>Fishing revenues</i>	<ul style="list-style-type: none"> <li>• Fish catch and services levies/cost recovery mechanisms;</li> <li>• Eco-labelling and product certification;</li> <li>• Fishing access payments;</li> <li>• Fishing license fees and excise taxes;</li> <li>• Aquaculture license fees and taxes; and</li> <li>• Fines for illegal fishing.</li> </ul>
<i>Energy and mining revenues</i>	<ul style="list-style-type: none"> <li>• Hydropower development- Compensation paid by Gov. to displaced communities</li> <li>• Contributions by energy companies for livelihood support, such as restocking or reservoirs</li> <li>• Mining- Compensation paid to communities affected by pollution from mining waste.</li> </ul>
<i>For-profit investments linked to fisheries conservation</i>	<ul style="list-style-type: none"> <li>• Private sector investments promoting conservation; and</li> <li>• Biodiversity prospecting.</li> </ul>

REVENUE TYPE	SOURCE OF REVENUE
<i>Other sources</i>	<ul style="list-style-type: none"> <li>Loans; and</li> <li>Income derived from local enterprises such as handicrafts, aquatic products, and visitor gifts.</li> </ul>

**Activity:** Agree management actions, and relevant compliance and enforcement actions.

**Activity:** Agree financing mechanisms to support the above.

## FINALIZE THE EAFM PLAN

Steps 1-3 of the EAFm process culminate in the material needed to develop the EAFm plan. This plan specifies in ONE document, all of the elements needed for the implementation of the EAFm.

The template below shows the main elements of a typical EAFm plan. Most of the information for the plan should now have been collected through the stakeholder consultations, research (scoping) and through secondary data collection and collation.

In many cases, the act of going through the consultative process to develop the EAFm plan may be just as important as the Output itself. The process used should foster ownership of the plan, instil the trust of other stakeholders and start to build a sound working relationship between stakeholders. It should also allow for stakeholder roles and responsibilities to be clarified, and can form important links between major players such as research institutes and fishery agencies, thereby making the work of each organisation more closely aligned to the needs of the end-users.

## EAFM TEMPLATE

EAFm PLAN FOR FMU [NAME]	
<b>1. VISION</b>	The broad goal of management.
<b>2. BACKGROUND</b>	Description of the area and resources to be managed, including maps at different scales.
<b>The fisheries management area:</b>	Area of operation of the fishery, jurisdictions and ecosystem "boundaries" (including national/province/district jurisdictions).
	<ul style="list-style-type: none"> <li>Map of FMU.</li> </ul>

**History of fishing and management:**

- Brief description of the past development of the fishery in terms of fleets, gear, people involved, etc.

**Current status of the fishery :**

- Description of the fishery resources and fleet/gears used;
- Resource status;
- Map of resource use patterns.

**Current management (co-management) arrangements:**

- Existing management arrangements

**Socio-economic benefits, including postharvest:**

- Description of stakeholders and their interests (including socio-economic status);
- Description of other uses/users of the ecosystem, especially activities that could have major impacts and arrangements for coordination and consultation processes;
- Social and economic benefits, both now and in the future.

**Special environmental considerations:**

- Details of critical environments, particularly sensitive areas and endangered species.

**Institutional aspects:**

- Legislative background;
- Existing co-management arrangements – roles and responsibilities;
- MCS arrangements;
- Consultation process leading to the plan and ongoing activities;
- Details of decision-making process, including recognized participants;
- Nature of rights granted in the fishery and details of those holding the rights;
- Maps of management interventions/user rights/jurisdiction boundaries.

**3. MAJOR THREATS AND ISSUES****Ecological issues:**

- Fisheries resources and general environmental issues, including both the impact of the fishery on the environment and vice versa.
- Water issues

**Social and economic issues:**

- Issues relating to the people involved in fishing, the general public and at the national level, including gender issues.

**Governance issues:**

- Issues affecting the ability to achieve the management objectives.

**4. GOALS OF MANAGEMENT**

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Goals for each component (for different sets of issues)

### 5. OBJECTIVES, INDICATORS , TARGETS AND BASELINE

Priority issues, to be addressed by the objectives, targets, indicators and baseline for the fishery, covering:

- fishery resources;
- environment (including bycatch, habitats, prey protection, biodiversity, etc.);
- social;
- economic;
- governance (ability to achieve the plan).

### 6. MANAGEMENT ACTIONS

Agreed actions for the plan to meet all objectives within an agreed time frame, including bycatch, habitat protection, socio-economic benefits, good governance, etc.

Water-use agreements/agreements mad with other departments or ministries...

### 7. COMPLIANCE

For actions that require rules/regulations – arrangements for ensuring that the management actions are effective.

Also those actions that others are supposed to implement

### 8. DATA AND INFORMATION NEEDS

Data and information needs to monitor implementation of the plan. Clarify where the data are to be found and who collects, analyses and uses the information.

### 9. FINANCING

Major sources of funding.

### 10. REVIEW OF THE PLAN

Date and nature of next review(s) and audit of performance of management.

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<sup>1</sup> The EAFm plan should refer to how the data and information required to monitor the indicators will be collected or collated and who is responsible.

<sup>2</sup> Review of the plan will be covered in [Module 17 Step 5.2](#), but a mention is needed here on the M&E process and frequency.





## **MODULE 15: STEP 4.1 FORMALIZE, COMMUNICATE AND ENGAGE**

### **SESSION OBJECTIVES:**

- Develop an implementation work plan;
- Summarize what is meant by formal adoption of the EAFm plan;
- Develop a communication strategy.



## OVERVIEW

This module explains how to formally adopt the EAFm plan and how to develop a work plan for the effective implementation of the plan. It also discusses how a EAFm plan communication strategy should be developed.

## INTRODUCTION

Once the EAFm plan has been approved and agreed, implementation should start as soon as possible in order to capitalize on the good will and excitement that should have been generated by the negotiations amongst stakeholders.

Implementation is comprised of the activities through which the EAFm plan is carried out. The implementation process will involve numerous decision-making points and a different process from the one used to create the plan and the agreements.

All the activities in the EAFm plan must be implemented correctly and in a timely manner if the goals and objectives are to be achieved.

Time scales for implementation can be a problem, if the planning process has taken too long, as it may result in a loss of momentum, particularly if staff or governments change.

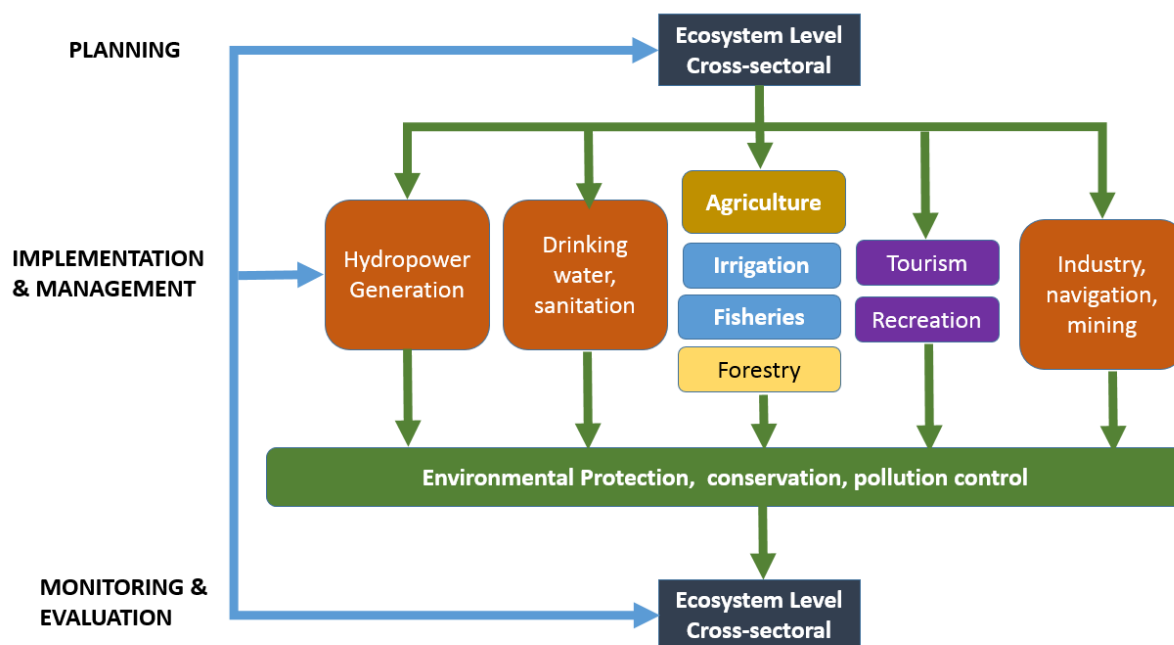
Many of the problems facing fishery management (loss of water flows and connectivity, water pollution, introduction of exotic species, destruction of fish habitat, climate change), fall outside of the control of fisheries managers. Therefore, implementing the EAFm plan will require fisheries managers to reach out, coordinate and integrate themselves within broader processes of irrigation management, integrated water management (IWM), integrated watershed management ☺ (IWM), conservation management and (as started during the Startup tasks). If these processes do not exist, coordination with at least the environmental agency will be required.

In practice and because the world is structured along sectoral lines (e.g. irrigation, agriculture, forestry and fisheries; hydropower, mining; environment, recreational fishing, tourism), sectoral management will likely be the entry point for more the more integrated management approach of EAFm.

Thus, while planning, monitoring and evaluation are carried out at the ecosystem level, implementation will require working with other sectoral agencies, including the environment protection and conservation agency (see Figure 15.1 below).

Implementation will, therefore, require trusting the plan and trusting the partners and staff of the fisheries and other agencies. The initial EAFm plan may not be perfect. There will be successes and failures. This is why the continual monitoring and learning-by-doing (adaptive management) has been emphasized. There may well be failures in implementing EAFm early on, as everyone learns to work together and to do their job but it is important that everyone learns from any failures and moves forward together.

**Figure 15.1:** Implementing EAFm: integrating sectoral management within ecosystem planning, monitoring and evaluation



Given the importance of the high degree of stakeholder participation and cross-sectoral coordination, the implementation of the EAFm plan should include specific measures and mechanisms to continue engaging all parties throughout the co-management process. This can include such joint activities as: participatory research; co-management; management councils and committees involving stakeholders in co-management decisions, on a regular basis; and the use of traditional and local knowledge (as explained in [Module 9 Startup B](#) and further detailed in [Module 16 Reality Check II](#)).

### FORMALIZING THE EAFM PLAN

To implement the agreed set of co-management arrangements it is often necessary to have these arrangements formalized. Depending upon the jurisdiction and fishery, this may need to be a formal, legal document and in some cases may even require parliamentary approval. In other cases, legislation may be needed to recognize the EAFm plans. At the other end of the spectrum it may be as simple as a list of activities agreed to, and maintained by, the local community leadership group.

It is necessary to determine what level of formalization is required for the EAFm plan to ensure that the specific arrangements are both legally and socially enforceable by the relevant authorities or groups. This may involve a “central” management authority, local or regional authorities or local community leaders, or some combination of these. There is little chance of success if the plan is not endorsed by those who can influence (for better or for worse) implementation of the plan.

More details on legal and policy support are provided in [Module 16 Reality Check II](#) which focuses on governance. Once a new or revised EAFm plan has been formally

approved it is vital that this is communicated to all the stakeholders who could be affected by any changes to their previous co-management roles, responsibilities and activities.

## THE WORK PLAN TO IMPLEMENT THE EAFM PLAN

Managers will benefit from using an implementation work plan that outlines what needs to be done to implement the EAFm plan, by whom, by when, and where. To generate such a work plan requires going through the full set of EAFm actions developed in **Module 14 Step 3.3** and determining (i) what are the specific tasks that need to be undertaken? (ii) who are the actual persons/institutions that will be responsible for completing these tasks? and (iii) by what date will the tasks be complete?

Headings that could be used for such a work plan include (i) information/knowledge management; (ii) management actions and fishery monitoring; (iii) legal/institutional strengthening; and (iv) human capacity development.

In order to develop a realistic work plan it is important to ask: are there really enough resources (both people and financial) to complete each of the tasks?

This work plan needs to be developed by the fishery management agency because it is their staff and resources that will be most likely involved in starting up the process. If specific actions are to be undertaken by other groups, they need to be involved in the planning stages for these aspects. The work plan should include a schedule of activities and responsibilities, with clear milestones.

### *Basic work plan format*

- For all the management actions identified in the EAFm plan, determine what needs to be done, by whom and when. A matrix with column headings of What, Who, When and Where is a good tool for this.
- It may also be necessary to have some separation of activities based on whether they are dealing with different functional components of the fishery –rivers, lakes, wetlands, transboundary waters etc. Undertaking consultation may be very different for the various groups and separate activities may therefore need to be generated.
- The process should clearly identify where changes are needed, such as by the implementation or modification of legislation, regulations, licence conditions or policies. If so, these need to be scheduled.
- The process should also identify the activities that may be outside the scope or jurisdiction of the fisheries agency. In these circumstances it may be necessary to advise other government departments of the issues they should be dealing with. Such interdepartmental governance issues are often a high-risk area and such should be tackled with due caution and tack and with the support of Agency leads.
- Once all the activities have been identified, the assignment of priorities and timelines should be undertaken by the relevant fisheries/management agency.

## COMMUNICATION STRATEGY

Communication includes sharing the results of the EAFm plan with the identified target audiences and identifying ways to adapt co-management practices to improve EAFm. A

communication strategy provides a clear process for sharing results in a logical and strategic way.

Startup B discussed ways of initially engaging and consulting with stakeholders. Once the implementation of the EAFm process is underway, keeping stakeholders informed at the community level is important, to maintain the momentum and legitimacy of the co-management system and its functionality (e.g. its capacity to adapt to change). This is especially important in the case of a community-based fishery. Keeping the government committed to new types of action will generally require direct discussions with key political leaders and not merely the submission of reports.

### RELEVANT QUESTIONS

- Who needs to know about the fishery and why? Are they interested in all aspects or just some aspects of the fishery?
- What communication format is appropriate for different target audience types: formal report, newsletter, website, etc.?
- What should the frequency of the communication products be for each audience?
- What should the report contain: information on successes and failures; progress and blockages; problems and solutions; present as well as future perspectives?
- What action is expected from the audience in return?
- What impact are the reports expected to have: the raising of awareness; institutional response?
- How to get feed-back from the reports?

### A COMMUNICATION STRATEGY WILL INCLUDE

- an analysis of the range of possible internal and external audiences, their characteristics and a set of priority target audiences;
- a plan for how and where results will be delivered by identifying which media and formats will be used with each audience group, and the approach and style of delivery to be taken;
- a set of key messages which illustrate examples and stories that explain the results and help focus the attention of particular target audiences; and
- the timeline of when messages and presentation formats are to be released and delivered to target audiences.

### POSSIBLE HEADINGS FOR A COMMUNICATION STRATEGY

1. Communication objectives
2. Stakeholder audience
3. Messages
4. Media and format
5. Personnel/human resources
6. Relationship strategy

## MEDIA AND OTHER COMMUNICATION FORMATS

These could include: meetings, workshops, news articles, web pages, emails, newsletters, status reports, social media and PR materials. Consideration must be shown, not only to levels of literacy, but also to what is socially or culturally acceptable. Remember how some audiences are more accessible than others; ensure all potential audiences are catered for (including the less powerful, less literate, the ones with a lesser voice). Refer to **Tool n.36** for suggested methods.

Once these pieces of the strategy have been pulled together, it will be possible to estimate the time, and human and financial resources needed to complete the communication strategy (Table 15.1).

**Table 15.1:** Basic communication strategy template

Target audience	Communication method (how & where)	Key messages	Timing

## **MODULE 16: REALITY CHECK II**

### **SESSION OBJECTIVES:**

- Check on the status of the EAFm plan implementation
- Consider whether implementation is in line with the principles of EAFm
- Check on the practicalities – is the supporting environment in place?
- Revisit the constraints and opportunities in meeting your FMU goals



## OVERVIEW

This module outlines the second reality check. This check takes into account the main principles of EAFm introduced earlier, as well as some important practicalities in terms of the supporting environment. It stresses the need for an effective legal framework; effective compliance and enforcement; nested institutions and coordination mechanisms; appropriate scale; capable fisheries management institutions and human capacity; as well as adequate human and financial resources. If these are not in place, either the EAFm plan will need to be modified or the institutional weaknesses rectified.

## INTRODUCTION

While implementation is based on the plan and agreed activities, the quality and effectiveness of implementation are shaped by a number of governance issues or the “ability to achieve”. As part of the EAFm process, seven principles were considered as key elements of good governance and were described. In Startup A, coordination with other agencies and levels of government was highlighted, and the legal basis for the FMU was explored in Reality Check I. Startup B focused on participation and co-management. Governance issues were also identified when prioritizing EAFm issues during [Module 11 Step 2.2](#). In this module, a reality check is undertaken to firstly, determine whether all the important building blocks that will enable EAFm implementation are in place, and secondly, whether the necessary supporting governance frameworks are in place.

### A. REALITY CHECK AGAINST THE SEVEN PRINCIPLES OF EAFM

A number of questions can be asked to check how well the implementation of the EAFm plan aligns with the seven principles of EAFm (table 16.1) and then a subset of questions relating to each principle needs to be examined (see below).

**Table 16.1:** EAFm principles in practice

<b>1. Good governance</b>	<b>NO</b>	<b>PARTLY</b>	<b>YES</b>
<i>Is there an adequate legal framework?</i>			
<i>Are rules and regulations in place and agreed to by stakeholders?</i>			
<i>Are effective compliance and enforcement arrangements in place?</i>			
<i>Are effective governance arrangements in place?</i>			
<b>2. Appropriate scale</b>	<b>NO</b>	<b>PARTLY</b>	<b>YES</b>
<i>Is management at the appropriate ecological, human and governance scales?</i>			
<b>3. Increased participation</b>	<b>NO</b>	<b>PARTLY</b>	<b>YES</b>
<i>Is co-management with relevant stakeholders working?</i>			
<b>4. Multiple objectives</b>	<b>NO</b>	<b>PARTLY</b>	<b>YES</b>
<i>Have the different objectives for management been considered and trade-offs made?</i>			

5. Coordination and cooperation	NO	PARTLY	YES
<i>Are nested institutions and resource user groups working? Is cooperation, coordination and communication taking place?</i>			
6. Adaptive management	NO	PARTLY	YES
<i>Can the management system learn by doing and adapt accordingly? Are the results of Monitoring and Evaluation (M&amp;E) being communicated and acted on by adapting the plan and subsequent management?</i>			
7. Precautionary approach	NO	PARTLY	YES
<i>Has management commenced despite a lack of data and information?</i>			
<i>Are management actions more conservative when there is greater uncertainty?</i>			

## 1. GOOD GOVERNANCE

### An adequate legal framework

Internationally, the instruments for an EAFm are mainly contained in voluntary agreements including:

- Rio Declaration on Environment and Development, Rio de Janeiro, 1992
- Agenda 21 of the UN Conference on Environment and Development, Rio de Janeiro, 1992
- FAO Code of Conduct for Responsible Fisheries, Rome, 1995 (CCRF)
- Voluntary Guidelines for securing sustainable small-scale fisheries (VGSSF)
- Voluntary guidelines on the responsible governance of tenure (VGGT)
- Convention on biological diversity (CBD)

At present, few fisheries organizations or national policies and legislation make explicit reference to EAFm, although this is now changing. Many countries now have a legislative framework that does not constrain EAFm or co-management and, in many countries decentralization policies and the legislation to support these policies, can be used to endorse EAFm development and promote fisheries co-management.

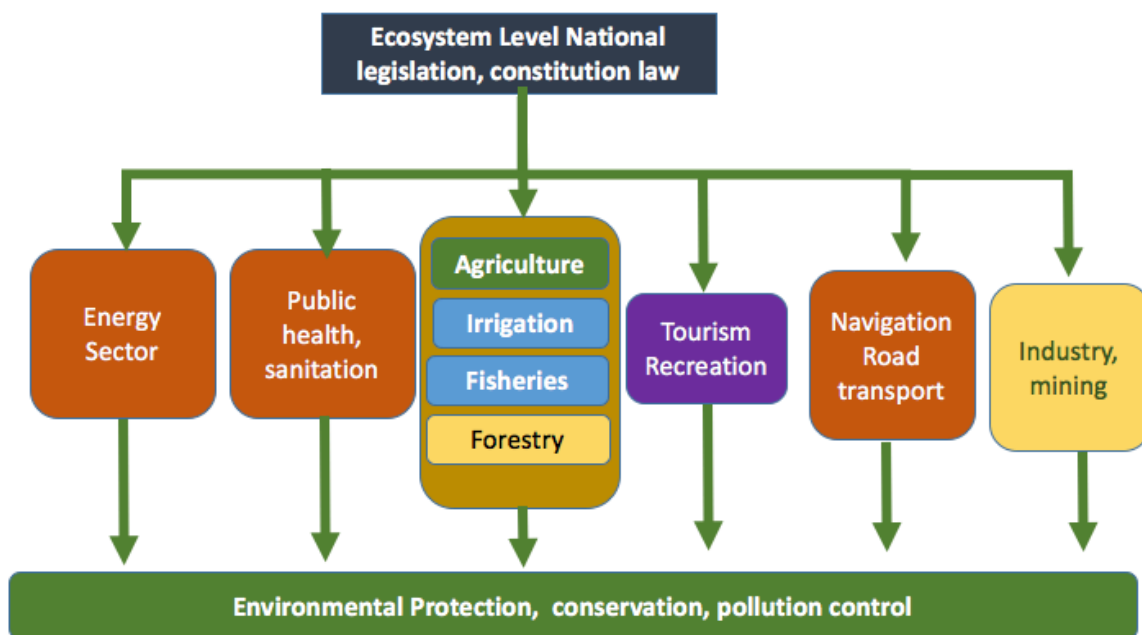
In the long term, EAFm may require that existing legal instruments, and practices that interact with or impact on fisheries, be reconsidered and that adjustments are made where necessary. In the future, it may be necessary to regulate inter-sectoral interactions through primary legislation, e.g. laws controlling water abstraction.

Reviewing and confirming the legal basis for all plans, agreements, and proposed activities is an important activity for the implementation team to conduct, with a focus within and across local/municipal, provincial, national and international levels. The team should identify the relevant legislation and associated decrees/bylaws, ordinances and subsidiary acts for their particular country/region (noting that in many cases, the fishery and environment departments may not have a consolidated and comprehensive set). Refer to end of this module for FAO legal database web links.

The process of making laws and fisheries management plans is reliant on underlying legislation that provides a basis for use rights and legitimizes decision-making processes. The initiation of planning by communities can lead to effective local co-management plans. However, it is important that these are legitimized or placed within broader planning frameworks. If not, there is a risk that local planning actions will be undermined by outside forces that lie beyond the power of communities and the local co-management systems to influence.

Because the implementation of an EAFm plan is often applied across a number of sectors, each with its own responsible agency (for example, a fishery agency and a tourism agency), a number of laws will be relevant to the FMU, not just the fisheries laws (Figure 16.1). The environment agency is often the only natural resources based agency with cross-sectoral responsibilities.

**Figure 16.1:** Sectors that might have legislation relevant to EAFm. Note that the environmental agency and environmental laws cut across all sectors.



In cases where new or modified regulations are required, or where changes to the legal framework (e.g. a Fisheries Act) are needed, the drafting process could be assisted by exposure to good examples from elsewhere, and having access to legal experts. When drafted, these revisions often involve formal approval by Parliament, which may require specific consultations with politicians and their advisors. Having stakeholder support for the proposed changes will clearly assist in securing parliamentary approval.

Inadequacies in current legislation should not act as a deterrent to initiating the EAFm process. As issues and co-management actions are identified, the need for changes in policy and legislation will become apparent and the EAFm process can help guide policy

change, resulting in co-management systems becoming more enshrined in law, responsive and effective.

**As a reality check following questions could be asked:**

The chief question is: can EAFm be implemented within the current legal framework? In other words, are the current laws a constraint?

Other questions may be:

- 1) Are international commitments included?
- 2) Are there coherent multiple legal instruments – e.g. environment and fishery, national and provincial?
- 3) Are specific laws required to implement EAFm?

**Rules and regulations in place and agreed by stakeholders**

One of the keys to implementation of an EAFm plan is to have rules and regulations in place that are agreed to (or at least acknowledged) by stakeholders. This can lead to greater buy in and a higher probability of compliance. Through the EAFm planning steps, (i.e. linking management actions with objectives and core problems), the need and rationale for having appropriate rules and regulations should have become apparent to all stakeholders.

**As a reality check following questions could be asked**

- 1) Where the rules and regulations decided through a participatory process?
- 2) Are all stakeholders aware of the rules and regulations and how they were formed?
- 3) Is the M&E in place to evaluate whether the rules and regulations are achieving the objectives?

**Effective compliance and enforcement**

(Refer also to **Module 14 Step 3.3**)

EAFm is underpinned by effective compliance and this involves:

- participatory compliance and enforcement by stakeholders through co-management;
- enforceable legislation and control mechanisms (e.g. fishing gear licences,)
- extension work (i.e. working with fishers to improve awareness and compliance);
- data collection systems (e.g. landing site monitoring, catch certification);
- communication systems (e.g. radios, mobile phones);
- market inspections;
- international cooperation (e.g. regional fishery commissions).

As with all other components of the EAFm process, participation is key. By being part of the planning process, stakeholders are more likely to take ownership of the proposed co-

management actions and should be more compliant. In some cases, stakeholders can be part of enforcement teams, although care may be needed to clarify their roles and responsibilities.

It is important to establish a collaborative inter-agency mechanism to manage and facilitate compliance. Partnerships provide the authority for compliance and also the inter-agency mechanism to develop and coordinate compliance plans. Partnerships provide the necessary conditions for good communications and transparency and can address issues of corruption. Partner agencies can readily share knowledge and information on the fishery and its users. It will be important to initiate the partnership process with a meeting of the heads of all the key institutions involved in fisheries to assess their commitment. Partnerships composed of 10 people or less in size tend to be more manageable.

The lead agency will usually be the fisheries agency. The long-term goal of compliance should be to encourage voluntary compliance by the fishing communities/industry with the rules and regulations that govern the fishery (both formal and traditional). To achieve this, it is recommended that the partnership established for the FMU provides the strategic overview for compliance issues and helps to identify and use more effectively the compliance assets that exist at other levels (i.e. inspectors, surveillance data, etc.). The nested system of partnerships should be established at the district level, sometimes close to the fishery landing sites. The key institutions to be engaged in compliance partnerships might include:

- National/provincial/district fisheries and environmental agencies;
- Irrigation managers/Water User Groups
- Hydropower operators
- Community leaders;
- NGOs;
- private sector (fishers, traders and processors);
- Police; and
- River navigation

Each of the partners brings with them important compliance assets (local knowledge, boats, staff, pollution/biodiversity monitoring, water monitoring, Information Technology), that can be combined to provide a strong compliance network.

The sharing of assets should be stipulated in the partnership agreement. The partnership would require support from secondary partners - other government institutions (national/ provincial/district), or donors.

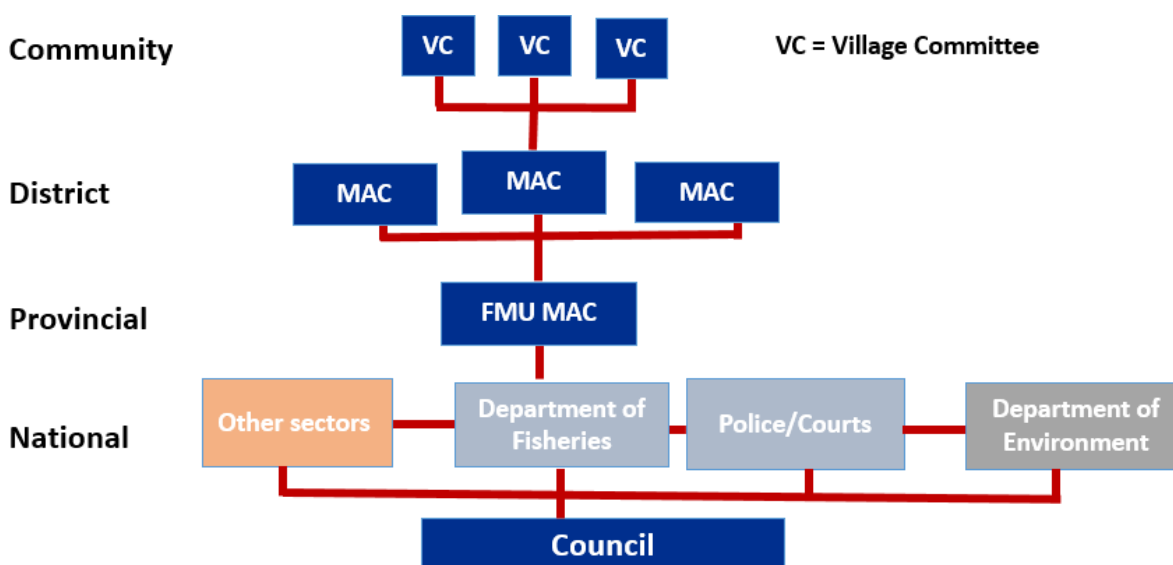
**As a reality check following questions could be asked:**

- 1) What are the existing fisheries and environmental enforcement and compliance arrangements – can they be strengthened?
- 2) Are the fisheries and environmental compliance systems aligned?
- 3) Are the stakeholders moving towards self-compliance through participatory planning, implementation and monitoring?

**Effective governance arrangements**

Cooperation and coordination, both vertically across different jurisdictional levels (e.g. Communities to National) and horizontally across relevant agencies involved in EAFm (e.g. across fisheries, environment and tourism) will need structural arrangements in place that formalize coordination and facilitate participation. A hypothetical governance arrangement is shown in Figure 16.2.

**Figure 16.2:** An example of a governance arrangement that coordinates across jurisdictions and agencies involved in EAFm.



At the Community level, villages have “Village Committees” (VCs) (sometimes two committees – one for men and one for women). Selected individuals of these VCs would be then be represented on “Management Advisory Committees” (MACs) at the District level. In turn, selected individuals would be represented at the Provincial level. This could also be the area designated as a FMU, and in that case it could be a FMU MAC. At the national level there could be a National EAFm committee with representatives of fisheries, environment, irrigation, agriculture, tourism etc. At the highest political level, an overarching Council made up of politicians from relevant Ministries could be providing policy guidance and direction.

**As a reality check following questions could be asked:**

- 1) Are there effective governance arrangements in place?
- 2) Do the arrangements cover both vertical (across jurisdictions) and horizontal (across agencies/sectors) dimensions?

**2. APPROPRIATE ECOLOGICAL, HUMAN AND GOVERNANCE SCALE**

In Step 1 of EAFm, the spatial scale and boundaries of the FMU were agreed. However, EAFm must be implemented within the context of the multiple spatial and temporal scales that reflect the natural hierarchical organization of ecosystems (e.g. from transboundary basin levels, such as the Nile River basin, to sub-basins, rivers, lakes and watersheds). Early on in this course, scaling issues were introduced in **Module 4 Principles and benefits of an EAFm**). Scaling up and scaling down are very real issues that need to be taken into account.

Since ecosystems are nested, part of one or other ecosystem may lie outside the FMU and EAFm often involves “scaling up”, or at least considering some externalities. If the FMU does not include impacts of other components of the fishery e.g. commercial large-scale fishing, then co-management for small-scale fishing could easily be undermined. Often it is practical to start EAFm on a relatively small pilot scale (e.g. a community fishing ground or a section of river fishery) and a next logical step would be to scale up to include alliances or clusters, for example a number of communities around a lake, wetland or river course..

One of the challenges of EAFm is to fashion ways to ensure that the actions of environmental and fisheries institutions at each level of government, are harmonized with one another and are consistent with agreed EAFm goals and policies. There is often a gap between national planning and policy goals on one hand, and the practical goals and implementation by local government on the other. This calls for a consistent approach across national and local levels, and reinforces the importance of having an inclusive framework that allows for the harmonization of policy and management objectives 😊. Management decisions that are matched to the spatial scale of the ecosystem; to the programs for monitoring all desired ecosystem attributes; and to the relevant management authorities are likely to be more successful in achieving ecosystem objectives.

Cross-scale alignment for ecosystem management will take time and may not be achieved during the first iteration of the EAFm cycle. In some cases, the impact of unaligned scales on the FMU may only become apparent during the implementation and monitoring and evaluation phase (Steps 3 and 4). This situation can be improved when the plan is adapted for the subsequent iteration (Step 5).



**As a reality check following questions could be asked:**

With the goals and objectives that have been set for the FMU in mind;

- 1) How do the boundaries of the FMU relate to the wider ecosystem boundaries?
- 2) If the FMU only covers part of the ecosystem, are arrangements in place to align management across boundaries?

### 3. INCREASED PARTICIPATION

#### Co-management

Remember: co-management is a “Partnership arrangement in which a community of local resource users, government, other stakeholders and external agents share responsibility and authority for the management of the fishery, with various degrees of power sharing”.

Of special importance when working with fishing communities and stakeholders is whether or not they are empowered and organised. This involves increasing awareness, knowledge, skills and capacity so that stakeholders have the power and mechanisms to act and make rational decisions. Stakeholders need to be in a position where they can take ownership of decisions and outcomes, and act responsibly. Empowerment also involves promoting and sustaining motivation. By engaging with communities, the EAFm can assist in such empowerment, which may well have knock on benefits to the community, outside of the fisheries sector.

Community development is an internal process of growth and development that can be fostered by: (i) information sharing and dissemination, (ii) training, (iii) facilitation and mentoring by external agents, and (iv) networking. During the initial steps of EAFm, some if not all of these five methods to promote participation and community development, should have taken place.

**As a reality check following questions could be asked:**

- 1) Is co-management at the appropriate scale relative to the FMU?
- 2) Is there a legal basis for co-management?
- 3) Are communities empowered to engage in co-management?
- 4) Is there an effective co-management structure?
- 5) Is there equitable participation in co-management committees and group membership?
- 6) Are effective conflict management mechanisms in place?



## Community mobilization

EAFm requires the sustained, motivated participation of communities. Have communities associated/relevant to the FMU been mobilized? The following types of activities can initiate community mobilization and/or strengthen existing community or stakeholder groups for their participation in the EAFm process:

- environmental education;
- social communication;
- building alliances and networks;
- organizational development and sustainability;
- human capacity development; and
- sustainable financing.

Refer to [Tools n.9, 10 & 19](#) for more detail.

## 4. MULTIPLE OBJECTIVES - DIFFERENT OBJECTIVES AND TRADE-OFFS

Because EAFm covers the ecological, human and governance dimensions of sustainable development ☺, conflicting objectives of co-management may arise. For example:

- ecological objective: reduce the fishing effort and the number of fishing boats;
- economic objective: make fishers and supporting value chains more economically viable;
- human objective: increase employment; and
- governance objective: increase revenue collected from the fisher sector.

The first two objectives should be compatible – reducing fishing effort should result in increased catches per unit of effort, especially of higher value species. However, it may not result in increased employment. In such a case, another intervention may be necessary, such as the promotion of alternative livelihoods for those displaced by the co-management actions. In reducing fishing effort and the number of boats, there will likely be “winners” and “losers”, In cases where the “losers” have lost their right to fish, some sort of compensation or promotion of alternate employment opportunities and training becomes necessary.

As stressed throughout this EAFm course, it is important to develop packages of co-management actions that will achieve an acceptable trade-off of all desirable objectives. With a limited natural resource such as a lake fishery, it may not always be possible to have: (i) healthy fish stocks, (ii) a healthy environment, (iii) vibrant economies and (iv) full employment, all at the same time, despite over-arching policies that may try to suggest otherwise.

**As a reality check following questions could be asked:**

- 1) Does the EAFm plan cover objectives that address all the high priority issues identified for the FMU?
- 2) Have the trade-offs between competing objectives been considered and agreed?

## 5. COORDINATION AND COOPERATION

### Nested institutions and resources

Throughout this course it has been emphasized that in EAFm there is a need for fisheries and environmental institutions to work together to ensure coordination, consultation and cooperation, including joint decision-making with other interacting sectors. Such an understanding will assist in highlighting negative inter-relationships, as well as those inter-relationships that contribute positively to improved governance. Institutions operate at multiple levels of jurisdiction and they work at different levels of society. They are often linked to each other and thus form networks of relationships that can improve governance through increasing coordination, cooperation and communication. An understanding of these institutional inter-relationships is important when considering an institutional adaptation to EAFm, because any successful change requires understanding of how the institutional system really works and which factors need to be considered.

Globally, there are many examples of how fisheries management fits within a government system. In many countries and regions, fisheries management is a national responsibility and is located within a ministry of fisheries, or as a component of a ministry of agriculture. In other countries, inland fisheries management is a provincial or state level responsibility. In some countries, responsibility for inland fisheries, natural resource management and conservation are devolved to the local level. There are linkages to other sectors such as irrigation water management and also hydropower dam operation (although these may be regulated at the national level) Whether or not fishery management – or at least some management functions – have been partly or largely devolved to community entities, the government will be involved in a coordinating or policy-making role. In particular, within EAFm, there is an important role for inter-departmental and/or inter-governmental linkages – from aquaculture and shipping to tourism and agriculture.

A high degree of inter-connectedness between institutions can produce patterns of dynamic change – changes to one part of the system that have effects on other parts of the system, and a new balance may be established. Likewise, a small change to one part of the system may lead to cumulative effects on the system as a whole. For example, by allowing an increased range of stakeholders to participate in decision-making procedures, changes to the system of management institutions may be required in order for increased stakeholder participation to be viewed as legitimate.

Ideally, a nested structure for fisheries management should be set up to include fairly large-scale areas such as rivers basins, large lakes or trans-boundary water bodies, for

which integrated management plans could be developed by a basin/regional advisory council and serve as the basis for centralized decision-making. Such overarching management areas could be subdivided into national waters, or sub-basins/watersheds. If appropriate, even smaller-scale planning units might be considered e.g. where local districts could serve as the basis for devolved co-management.

### Cooperation, coordination and communication

Increased coordination, cooperation and communication within and between relevant institutions and resource user groups are required, both in the planning process (Steps 1-3) and in implementation (Step 4). This requires a clarification of roles and responsibilities, improved coordination and integration across government and other users, and more accountability across stakeholder groups. There are implied benefits from such policy and operational coordination, although it is important to assess the costs involved in this as well.

#### Further questions when checking whether institutions are coordinated:

- 1) Has any conflict over management responsibility been resolved and are institutions, (such as irrigation and fisheries departments working together in an integrated fashion?

## 6. ADAPTIVE MANAGEMENT

As stressed earlier, it is critical to adopt an adaptive management approach. One of the keys to this is to have a good M&E system in place.

Developing effective targets and indicators that link to the objectives of co-management was considered in [Module 13 Steps 3.1 and 3.2](#). When these are included in the M&E system (as discussed in the next [Module 17 Step 5.1](#)), the performance of co-management can be tracked and adapted based on lessons learnt during its application.

No management system is likely to get it right first time. Human behaviour dictates that whatever rules and regulations are put in place, fishers and other stakeholders will find ways to circumvent them. There may also be unexpected consequences that were not envisaged in the planning phase. As long as these are recognised and acted on, no harm will be done in the long-term.

## 7. PRECAUTIONARY APPROACH

### Management initiated despite lack of data and information

The precautionary approach stipulates that lack of information is not an excuse for delaying management actions. Data on many inland fisheries is often poor in quality, particularly in cases where most of the fishers are small-scale and may not be marketing fish through clearly defined channels. Very often, when considering the initiation of an activity, the exact target of the co-management action will not be known. For example, the co-management action might be to reduce the number of boats when the optimal number (capacity) for the fishery is not known. However, declining fish catches over time

would suggest that there may be too many boats chasing too few fish. Reducing boat numbers can take years, so that while the reduction is taking place a lot more data and information can be collected and, as numbers decrease, the optimal number of boats that the fishery can support, will become clearer.

### **Risk averse management actions**

The precautionary approach also stipulates that management should be more conservative (i.e. more risk averse) where there is more uncertainty.

For example, if the impact of a particular fishing gear on a critical habitat is not really known, a conservative approach would be to limit the use of the fishing gear to the extent possible, in the event that the gear type does indeed damage habitat. It would then be necessary to prove that the gear does not damage the habitat before the co-management action would be revoked. An example of this is the use of small mesh nkacha (open water seine) nets on Lake Malombe in Malawi, which are known to catch juvenile fish and damage aquatic vegetation and tilapia spawning substrates.

## **B. SUPPORTING ENVIRONMENT**

In the implementation phase of an EAFm plan, there must be a supporting environment that will foster success. Important questions are:

1. Is there adequate political will and support?
2. Are there adequate resources (personnel, equipment and training) for EAFm?
3. Is there an effective financing mechanism?
4. Is there an appropriate institutional structure?

In this reality check phase, these need to be tested to see if the plan can really be implemented.

### **1. ADEQUATE POLITICAL WILL AND SUPPORT**

The adoption of an EAFm management approach assumes that there is some political will to address the three areas of human well-being, ecological well-being and good governance. EAFm emphasizes the need for a longer-term commitment, which spans short-term appointments and three-year planning and budget horizons. The reality of a rapid turnover of high-level policy makers in government and short political terms, should not limit the long-term strategic implementation of the EAFm.

Successful implementation of an EAFm plan will often depend on having political backing. This can be difficult to secure if the politician and senior policy makers perceive that the plan has the potential to cause conflict and attract criticism from stakeholders. This in turn may affect his/her popularity and future votes. However, given good participation and communication, strengthened political will can often be gained.

In the first instance, it is important to engage politicians in the planning stage of EAFm and they should be included as stakeholders with influence. The communication strategy should also include politicians and senior policy makers (**Module 15 Step 4.1**). As a special target audience, they need to be given clear messages on the importance of the inland fisheries sector, especially in terms of food security, poverty alleviation, nutrition and health, not just the GDP, which may be relatively small. They will also need clear

messages on why implementing EAFm is good for their constituents, especially in terms of improved livelihoods and economic stability.

In many, cases the EAFm team may not have direct access to politicians or senior policy makers. However, they may have access to someone who does have regular contact with them. These people may be key to changing mind-sets and perceptions, and need to be advocates for EAFm and change. As with all stakeholders, the more they are involved in the process, the more likely they will be to advocate for the benefits, especially when they see positive outcomes. The formation of a Council made up of politicians and senior policy makers from relevant Ministries can also facilitate dialogue and buy in (see 4. Effective governance arrangements below).

**Key questions when checking on political will, could include:**

- 1) Have the politician/senior policy makers been engaged in the EAFm planning process?
- 2) Have clear messages for politician/senior policy makers been communicated and understood?

## **2. ADEQUATE HUMAN AND OTHER RESOURCES**

Human resources are a critical factor in the successful implementation of EAFm. Human resource problems often include the lack of capacity, as well as the difficulty of retaining good staff in the government sector. Capacity development should provide new knowledge and skills to relevant stakeholders – fishers, resource user organizations, government officials and staff, and others that are committed to taking an active role in co-management. Capacity building often implies that activities are carefully planned and executed, following a clear plan. In reality, capacity building often involves more experimentation and learning on the job. For this reason, the term ‘human capacity development’, which implies an organic process of growth and development, is more appropriate than the term ‘capacity building’.

Human capacity development can be defined as:

“The process by which individuals, groups, organizations, institutions and societies increase their abilities to: (1) perform core functions, solve problems, define and achieve desired objectives, over time; and (2) understand and deal with their development needs in a broad context and in a sustainable manner.”

This definition highlights two important points: (i) that capacity development is largely an internal process of growth and development; and (ii) that capacity development efforts should be results-oriented. Within EAFm, these efforts should focus on results linked to the EAFm plan.

The objective of capacity development is not to supply a product or service, but to foster the development of specific individuals and organizations. Capacity development is often needed to raise an organization's performance level, which is reflected in its efficiency

(minimizing costs), effectiveness (achievement of its goals) and sustainability (relevance and acquiring resources for operations).

Obviously the content of capacity development will be different for different target groups but during the planning phase “science skills” (both formal and traditional knowledge) will be required for resource assessments, fishing operations, ecology, etc., and “people skills” will be required to facilitate stakeholder involvement, including conflict resolution, negotiation skills and participatory engagement. Developing the EAFm plan will require an understanding of legislation and how to develop a lawful EAFm plan with stakeholders.

During the implementation phase, presentation skills, communication skills (especially with fishers and fishing communities, policy decision-makers and the media) will be required. Many scientists need to improve the way they communicate their results so that the information they present is useful to policy makers and other stakeholders. MCS skills will also have to be developed. In the M&E phase, competencies in data collection and analysis, for assessing the plan’s performance, will be required.

The core capacities of an organization or community, therefore, consist of:

- defining and analysing the environment or overall system;
- identifying needs and/or key issues;
- formulating strategies to respond to or meet needs;
- devising or implementing actions;
- assembling and using resources effectively and sustainably;
- monitoring performance, ensuring feedback and adjusting courses of action to meet objectives; and
- acquiring new knowledge and skills to meet evolving challenges.

In the context of participatory planning and management, local capacity will be required in order to:

- ensure local resource users, groups and organizations, fishing communities and the local government unit charged with fisheries co-management are more capable;
- ensure local resource users, their organization’s leaders, local government officials and staff and other stakeholders are able to undertake their roles and responsibilities in co-management; and
- improve the quality of fisheries co-management taking place at the community level.

Capacity development includes understanding what EAFm and co-management are and how to organize and participate in them; communicating with other stakeholders; dealing with administrative and business matters; and participating in negotiations. Capacity development is an on-going process and is the power of an individual or organization to engage with management.

It should be stressed that not every individual needs to have the same level of knowledge and/or capacity. This is why the participatory approach is powerful; necessary capacity exists across a range of stakeholders. Determining which stakeholders are involved in different steps of the process, is an important part of making the best use of combined



capacity. It is not necessary for all stakeholders to be involved in all activities. Forming small, specialized working groups is one way of facilitating this.

A key concept in capacity development is what is referred to as “social capital”. It is important to recognize that the social community is more than the sum of its individual parts. People form relationships that fulfil a number of social needs, such as communities of common interest, mutual obligation, care, concern, interest and access to information. These can be considered as networks of norms and trust, that facilitate cooperation for mutual benefits. Social capital facilitates a process of learning through interaction and is critical to achieving collective action and to sustain a social, economic and institutional environment that is ready to adapt and change. Social networks can be horizontal (across the community) giving communities a sense of identity and common purpose, and/or vertical (government to community to individuals) to broaden capacity and support (see community mobilization (alliances and networking) in [Module 9 Startup B](#) and [Tools n.9, 10](#)).

Capacity development cannot be “done” by outsiders. An external agent can promote or stimulate capacity development and provide information, training and other types of organisational support, but an external agent should not attempt to lead an organization's capacity development effort or take responsibility for it. The organization's managers and members must set their own goals and make their own decisions. Leadership must emerge from within the organization and its members must do most of the required work.

Capacity development involves the acquisition of new knowledge and its application in the pursuit of individual and organizational goals. This is the reason learning by doing, or experimental learning, lies at the heart of capacity development.

The main tools for capacity development include one or more of the following approaches:

- information dissemination ([Module 9 Startup B, section 6](#));
- training to develop knowledge, skills and attitudes ([see Tool n.9](#)); and
- facilitation and mentoring by an external agent ([Module 9 Startup B, section 2](#)).

Networking, with the exchange of information and experiences from other people working on similar tasks, as well as through workshops, meetings and communities of practice. This should promote:

- feedback, in order to promote learning from experience within an organization (see participatory M&E [Tool n.38](#)).

The type and amount of capacity development will depend upon the organizations' goals and the budget available for activities. The provision of information or one-time training, whilst able to reach more individuals and organizations, seldom produces lasting changes in the participants' behaviour. Facilitation by an external agent is generally more effective, although it is more costly.

Enabling factors for capacity development include:

- an external environment that is conducive to change;
- top managers who are committed to provide leadership for change;
- a clear set of objectives and priorities;
- a critical mass of members involved in, and committed to, the change process;

- awareness and understanding of the initiative;
- open and transparent processes and decision-making;
- adequate resources for developing capacities and implementing change; and
- adequate management of the capacity development process.

#### **Key questions when checking human capacity could include:**

- 1) Do the staff responsible for implementing EAFm have appropriate experience and training in assessment and management of multi-species fisheries, whether under data-poor or data rich conditions?
- 2) Is the implementing EAFm team trained and equipped with the skills and knowledge required to identify and reconcile management objectives in an ecosystem, both ecological and social?
- 3) Is the implementing team equipped with “people skills” to facilitate a process that maximizes the benefits of a having a truly participatory process?

Obviously a range of other resources such as facilities and equipment are also required. These resources link closely to having sufficient funding (see below).

### **3. EFFECTIVE FINANCING MECHANISM**

In discussing financing earlier, it was pointed out that having an EAFm plan can help unlock financial resources. Early in the implementation phase, it is important that the EAFm plan be streamlined into the main activities of the fishery and other agencies and be included in the annual budgets. This requires knowledge of the timing of the budget cycle and links to the planners who formulate annual budgets.

In many developed countries, the cost of management (either fully or in part) is paid for by the beneficiaries of the management, i.e. the fishers and others in the value chain. The logic of this policy is that as the income and well-being of fishers and associated buyers and sellers is being increased by management, it is the people who benefit who should be paying the costs of management, not the public at large. This payment can be in the form of a levy or through some sort of license fee that includes part or all of the management costs. A similar “user pays” principle is also often applied to research. In this case, those who pay have a greater say in what research is carried out. One successful model is to have 50% of research funded by fishers, which is matched by government. Allocation of the research fund can be made through a board that consists of fishers, government and researchers. Not only does this pay for more research, it also assists in the prioritization of the research effort so that it stays relevant and useful to fishers.

Introducing a “user pays” policy, however, may not be popular with the beneficiaries and can be opposed through advocacy with politicians and other senior officials who may want to keep favour with the voters. As with implementing other EAFm components, moving to a “user pays” system will take time but is possible if a good co-management system is being adopted.



**Key questions when checking on financing could include:**

- 1) Has the implementation of the EAFm plan been mainstreamed into the activities and tasks of the relevant agencies, and has an annual budget been allocated?
- 2) Have other sources and models for funding (e.g. “user pays”) been adequately investigated?

**4. EFFECTIVE MANAGEMENT INSTITUTIONS AND ARRANGEMENTS**

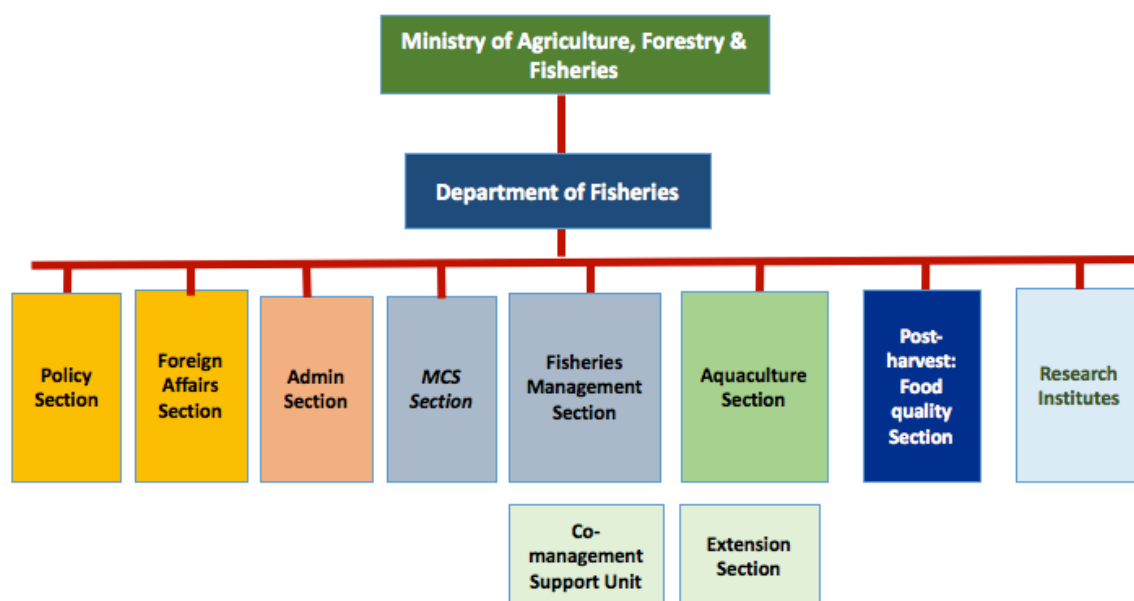
The capacity and structure of a fisheries management agency, and the fisheries science infrastructure, must be taken into account when considering EAFm implementation. In many developing countries, fisheries agencies do not have a fisheries management division/section/group and it should not be assumed that one exists.

Fisheries management units are more likely to be found in more developed countries. A quick institutional analysis (see [Tool n.22](#)) can be used to look at the structure and function of the existing arrangements. In many cases, it may be necessary to develop the human capacity and infrastructure needed to manage fisheries.

The FAO approach to EAFm implementation is to build on existing management structures and processes, as these are already based in the local context and can be adapted but not simply replaced. The nature of these existing structures and processes will affect the benefits and costs, and the time frame, of EAFm implementation.

One of the main institutional changes required for EAFm is a clearer definition of the roles and responsibilities of the different players in the integrated process that is being introduced. This will require a commitment to change and a passion to lead others through this change. Although in many political contexts this will mean taking risks, the risks will likely be outweighed by the benefits.

Fisheries agencies are often nested within a larger ministry that includes agriculture, forestry and as well as fisheries (see Figure 16.3 for an example).

**Figure 16. 3:** An example of a typical Fisheries Agency structure

In this example, the fisheries agency is called a “Department of Fisheries” and has a number of “Sections”. These sections usually cover different functions such as research, administration (especially registration/licensing), policy formulation and planning, foreign affairs and post-harvest (including food quality and processing). Some ‘Department of Fisheries’ may have a MCS Section, responsible for coordinating all the other agencies that are involved in MCS for fisheries.

In developed countries, there is often a “Fisheries Management Section” that houses the fisheries managers (see [Module 2](#) for a discussion and fisheries management and what makes a fisheries manager). Additional units for extension and co-management may also be formed within the fishery management section or standalone. These sections are often missing in the structure in developing countries, making implementation of an EAFm plan more challenging.

**Key questions on effective management institutions and arrangements could include:**

- 1) Who or what is responsible for fisheries management? This could be an individual mandated to manage as part of his/her job, or a team that works cooperatively to manage the fishery.
- 2) Does the lead fishery agency have a structure in place (e.g. management unit) whose staff are responsible for fisheries management?

**Activity:** Revisit your constraints and opportunities developed earlier and discuss how valid these still are for achieving your FMU goals. Amend as appropriate.

Note FAO has a computerized legislative database (FAOLEX) that is a one of the world's largest electronic collection of national laws and regulations on food, agriculture and renewable natural resources.

Legislation contained in FAOLEX covers some, but not all, aspects of legislation that may be relevant to inland fisheries (e.g. water law, national constitutions).

Users of FAOLEX have direct access to the abstracts and indexing information about each text, as well as to the full text of most legislation contained in the database. <http://extwprlegs1.fao.org/faolex/index.htm>.

## **MODULE 17: STEP 5.1 & 5.2 MONITOR, EVALUATE AND ADAPT THE PLAN**

### **SESSION OBJECTIVES:**

- Monitor how well management actions are meeting goals and objectives;
- Plan what has to be monitored, why, when, how and by whom;
- Evaluate monitoring information and report on performance;
- Review and adapt the plan.



## OVERVIEW

This module explains the importance of monitoring and evaluation (M&E) for effective EAFm. Section 5.1 outlines how to monitor and evaluate performance, essentially by collecting and analysing data related to indicators, as well as by collating these data and evaluating progress. Section 5.2 outlines the need for periodical review of the plan based on the M&E results and making changes to it if necessary.

## INTRODUCTION

The final step in the EAFm process is to monitor how the EAFm plan management actions are meeting the objectives and to feed this information back into the EAFm process so that the learning can be adapted and used. Thus, M&E and reporting of performance is a critical step in the adaptive management process. It is essential not only to ensure that adequate performance is being generated against current objectives, but if the results are favourable, it can also be an incentive for further involvement.

To facilitate learning-by-doing, a constructive attitude to both success and failure is required. If failures are regarded as an opportunity for learning, and if people are rewarded for identifying problems and promoting innovative solutions, learning-by-doing will be strongly encouraged. The challenge can be to recognize that adaptation and refinement of plans is a normal activity that occurs through experience and acquisition of new information (see adaptive management in [Module 4 Principles of EAFm](#)).

As explained in [Module 10 Step 1.3 Scope the FMU](#) and [Module 13 Develop objectives, targets & indicators](#), in data-rich situations managers can use a well-directed research program, with the support of appropriate technical expertise where needed. However, in the case of data-poor situations, they will need to make increasing use of adaptive management and the precautionary approach, as well as fishers' traditional knowledge, to overcome the constraint of insufficient knowledge. In both cases, using participatory approaches for data collection and analysis will enhance understanding and ownership.

## MONITOR AND EVALUATE PERFORMANCE

### MONITORING

Monitoring should be done during the whole of the plan's implementation. The frequency of monitoring activities will be indicator dependent i.e. some indicators will need to be monitored monthly, some seasonally and some annually.

Monitoring allows for an assessment of the EAFm plan's activities in order to determine whether goals are being achieved and what needs to be done to make improvements (adaptive management). The targets and indicators developed ([Module 13 Step 3.2](#)) and the FMU background information generated in the scoping phase ([Module 10 Step 1.3](#))

acts as the baseline, against which to measure progress. This is gradually built on over time.

At the simplest level, because specific objectives and indicators ([Module 13 Steps 3.1 and 3.2](#)) have been chosen to cover the important ecological, social, economic and governance issues, assessing the status of each indicator against its target should provide a snapshot of how well co-management is performing at the ecosystem level. A common mistake is to collect too much data, data that are irrelevant to the EAFm plan or which will never be used (i.e. a waste of time and resources.) Only collect data that is relevant and useful.

When planning for monitoring the main questions are: WHAT data are collected for WHAT purpose, HOW OFTEN and BY WHOM?

These responsibilities should be outlined in the implementation work plan developed in [Module 15 Step 4.1](#) (see [Tool n.38](#) for more participatory M&E approaches).

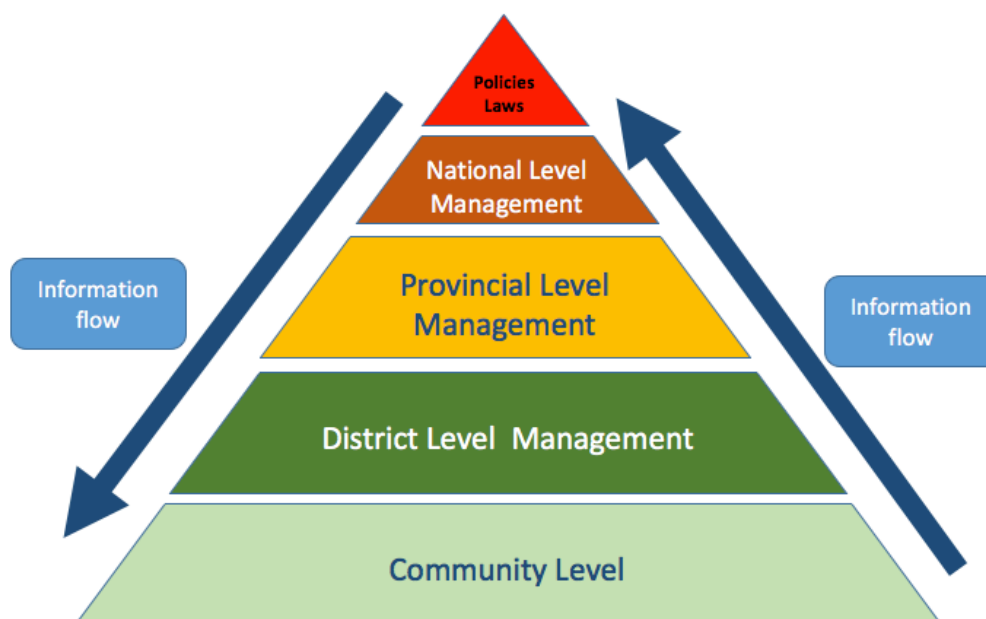
The EAFm team (who initiated and “holds” the EAFm process) might need to set up an assessment team (M&E team) composed of representatives from key stakeholder groups, or they can use the key stakeholders group itself, established in Startup A. This M&E team will coordinate data collection and analysis of co-management performance.

Different stakeholders should be involved in this process and it is essential to have feedback loops in place to foster learning and to enable adaptive management. The assessment team should regularly feedback the results of monitoring to the EAFm team (or other agreed overarching committee). The collated results should then be communicated to the wider stakeholder group (often as periodic evaluations).

## COMMUNICATING AND REPORTING

Different types of evaluation result will be required by different stakeholders. There should be upward and downward information flows between the different levels, ranging from the national level to the community level, as well as across sectors (Figure 17.1).

**Figure 17.1:** Monitoring information flows



The communication strategy developed earlier as part of EAFm Implementation ([Module 15 Step 4.1](#)) should outline who needs what M&E information, how (in what format) and when? Line managers and certain fisher stakeholders may need frequent, detailed data, such as monthly or quarterly monitoring data, to assess performance and be able to take immediate remedial action and/or redirect activities, if needed, to ensure that the agreed objectives can be met.

For example, if some of the agreed co-management actions include establishing a conservation area, and reduced take of key species, the EAFm team and the key stakeholder group will need regular data on how well the conservation area is being established and the extent to which it is being complied with, including changes in key resource user attitudes and perceptions. They will also require collated figures of recent monthly catches.

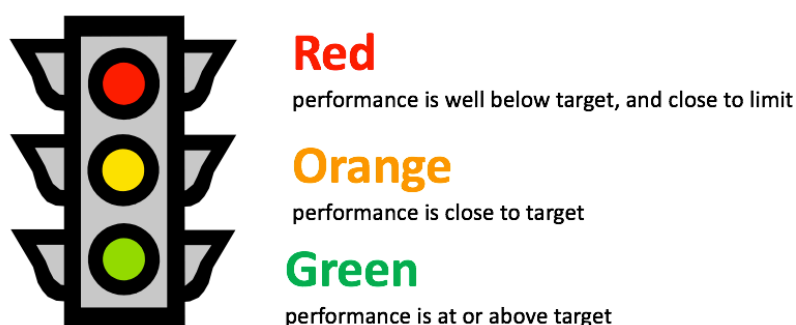
Other stakeholders will need less frequent feedback and less detailed information. For example, national or regional fishery and environmental agencies may need monthly catch figures compiled into quarterly or six-monthly reports, so that they can see if the co-management measures are impacting on different species, trade or commercial aspects. The same agencies may be interested in seeing the regeneration or rehabilitation of the ecosystem and key species. The tourism or social affairs departments would want to see not only revenue but also social impacts.

The idea is to share data and information between as many relevant sectors and agencies as possible in order to maximize knowledge and to help achieve the EAFm objectives. In some countries, sharing data between different departments in the same ministry can be a challenge, let alone sharing between different ministries. However, the EAFm approach of co-management, cooperation and inclusiveness established from the outset of the process ([Module 8 Startup A Task v](#)) should continually strive to foster this sharing of information and communication.

The communication strategy should also outline the format of reporting back by means of written documents (with or without templates, verbal workshops or other media).

A useful communication tool for summarizing the results of monitoring is the indicator “traffic lights” system. Data are entered into a computer program (basic Excel can do this) with pre-defined criteria/variables. The figures are then transformed into a visual image, whereby green = performance is satisfactory; amber (orange) = things are not progressing very well and caution is needed; red = performance is not satisfactory (Figure 17.2).

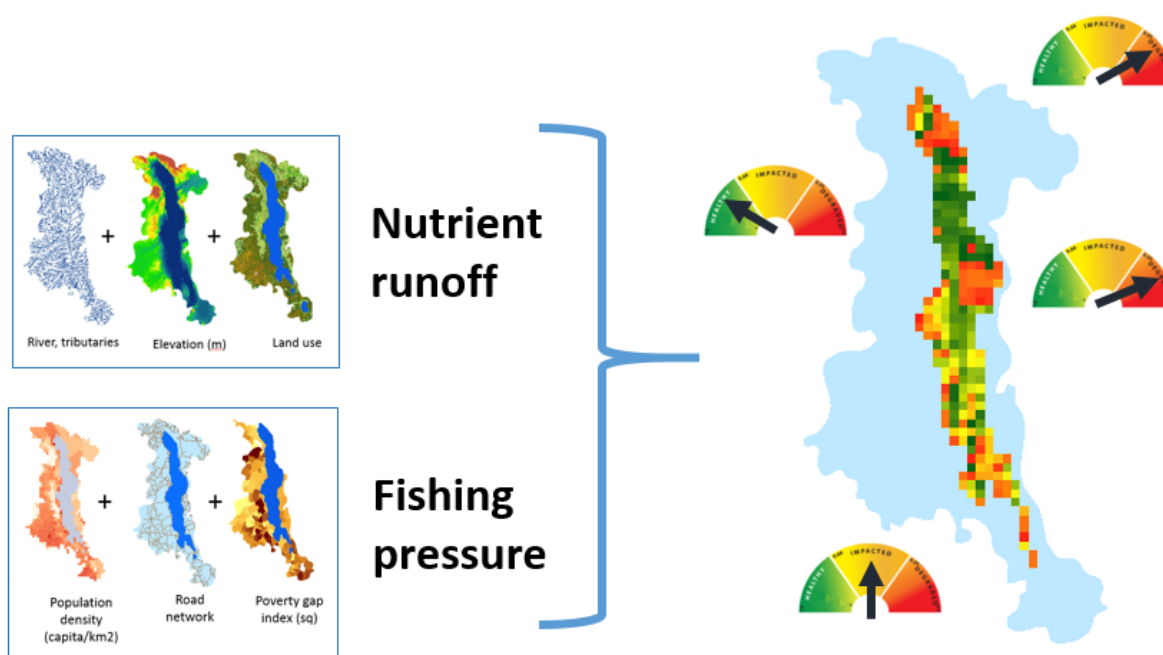
**Figure 17.2:** “Traffic light” reporting



In this way, the table or visual of on-going activities will immediately show which actions are on track and which require management review or redirection. Such a visual can tell managers at a glance which activities are not performing according to plan and therefore require more information, checking, analysis or remedial actions.

Remember that visuals cannot tell the whole story; before taking any action, managers would also have to read the relevant feedback report. Figure 17.3 shows the traffic light system used for the modelling of nutrient runoff and fishing pressure on Lake Malawi

**Figure 17.3:** Mapping of issues, to develop a traffic light system used for monitoring ecosystems (modelled for Lake Malawi)



## REVIEW AND ADAPT THE EAFM PLAN

The EAFm plan finalized in [Module 14 Step 3.5](#) should be adapted periodically, based on the M&E results. This involves using the results of the monitoring and periodic evaluations to improve the plan, and is usually carried out during regular reviews of the plan based on evaluations and reports. These take place with the purpose of assessing the performance of the co-management actions in achieving the objectives ([EAFm plan template 11. Review of the plan](#)). These reviews are the time to consider whether the EAFm plan should be changed or not. The assessment/M&E team will be involved in this process, though the review could also be facilitated by outsiders. In such cases, reviews should be carried out with guidance from, and while making regular reports to, the EAFm team.

## SHORT-TERM REVIEWS

These could be part of an annual cycle. The results should be summarized in an annual report that is easy to understand and that links with the fishery co-management process. In general the report will contain:



- performance assessments; and
- fishery co-management responses.

Data can be aggregated and displayed using the traffic light diagrams explained above, or via other graphs, tables or visuals. Remember that because such visuals cannot tell the whole story, some text that interprets and explains the key findings (or case studies in boxes) may also be required.

If the EAFm plan is working, there is reason to celebrate! Determine which aspects of the plan are working; if some aspects are not, it is necessary to establish why. It may then be necessary to adapt the plan, specifically looking at:

- co-management actions;
- compliance; and
- governance arrangements.

It may be that activities are going well and little change is needed. However, it may also be that things are not going as well as expected, and substantial changes are necessary. To do this, will require going back over the EAFm plan and its components, (including the reality checks) to make modifications and move forward. Regular reviews are an important element of the EAFm process as they support the flexible and iterative approach by formalizing continuous assessment.

All stakeholders need to understand what actions will be taken if co-management is not meeting its objectives. The EAFm team must be prepared to modify any part of the plan that isn't working well. This could be as serious as modifying the objectives, targets or indicators, or less serious in the case of modifying the co-management actions and compliance arrangements i.e. if they are stipulated in rules and regulations which are separate to the formalized plan. As with all decisions, the basic process consists of first identifying what the problem is and why it may be occurring. In many cases, the problem might be weak governance and inadequate compliance. This will obviously not require a change to the EAFm plan, but a change to the implementation work plan (developed in [Module 15 Step 4.1](#)), so as to strengthen compliance.

In data-rich cases it might be possible to set up formal decision rules based on how well an indicator is doing against its target or limit, e.g. if the level of a target stock falls below a reference limit point, fishing will be stopped until the stock has recovered. These are known as “decision rules” and can be built into operating models of the fishery. Operating models can be divided into biological operating models that describe the biological characteristics of the system, and economic operating models that describe the behavioural responses of fishers to imposed regulations and other conditions that affect their behaviour. They provide the background against which alternative management regimes can be compared.

### LONGER-TERM REVIEWS

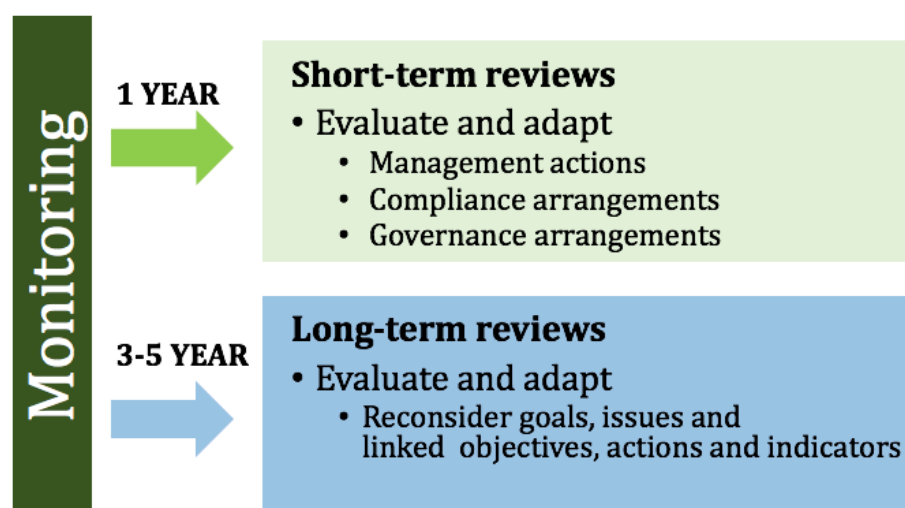
These should also be conducted on a regular basis (three to five years), preferably through an independent third party audit. Ideally these reviews should be planned to feed into broader strategic processes ([Module 6 EAFm plans – the link between policy and action](#)).

These reviews should include consideration of the full co-management arrangements including the high priority issues. Longer-term reviews may provide evidence that high priority issues set earlier are no longer appropriate.

Data collection, monitoring, evaluation and reviews all need to be budgeted for. During [Module 14 Step 3.4](#) when financing options for EAFm are explored, it is essential to earmark part of the budget for M&E activities, especially for evaluation and reviews, otherwise these are unlikely to happen.

To summarize, evaluations should be made at least annually. The yearly evaluations may trigger a review and adaptive responses in the co-management (if they are not working very well) and in the compliance and enforcement (MCS) activities. Every five years or so a major evaluation and review of the plan should take place, and if appropriate, the issues, goals and objectives should be examined (Figure 17.4).

**Figure 17.4:** The M&E process, including short-term and longer term reviews of the plan



**Activity:** EAFm Quiz

**Homework:** Review the group outputs of the EAFm process steps and start considering how these fit into the EAFm plan template. Start planning how you are going to present the EAFm plan on day 5. NB: the format is no PowerPoints.



## REFERENCES AND FURTHER READING

### USEFUL WEBSITES

EAFnet: <http://www.fao.org/fishery/eaf-net/en>

EBM Tools Network: <http://www.ebmtools.org/>

International Institute for Sustainable Development: <http://www.iisd.org>

FAOLEX FAO legal database on agriculture: <http://extwprlegs1.fao.org/faolex/index.htm>

Knowledge Management Toolkit: <http://www.kstoolkit.org>

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This Ecosystem Approach to Fisheries management training course (Inland Fisheries) is designed as a complete training course for the sustainable management of inland fisheries using the ecosystem approach. It is targeted at middle-level fishery and environment officers, extension workers, facilitators and other stakeholders engaged in the planning and management of inland fisheries. This training course is designed to be applicable to many inland fishery contexts around the world (including overlapping freshwater fishery/aquaculture systems). It is also intended to be adapted to suit specific local contexts. This volume is VOLUME 1: HANDBOOK FOR TRAINEES and contains the background reading material required for each of the training course modules.

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