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ECOSYSTEM APPROACH TO FISHERIES – EAF-GULF PROJECT

INTRODUCTION

1. This document aims to provide an advanced understanding of the core principles of Ecosystem Approach to Fisheries (EAF) and introduce the Fisheries Research and Management Project – EAF-Gulf Project.
2. EAF has been developed in recent years in order to address the failures of fisheries management practices. FAO has devoted a considerable amount of work in bringing the principles of EAF into practical fisheries management plans. EAF is basically a management planning process rooted in the principles of sustainable development and using risk assessment methodologies. It tries to balance out different societal objectives such as the resources, the ecosystem and the human dimension of fisheries. This is done through the development of a fisheries management plan with the active participation of stakeholders.
3. The planning process goes through four main steps in order to identify the scope of the management plan, identify the issues concerned and decide which are the most important priorities and then develop the management system with several management measures. The last step involves the monitoring and review of the management measures put in place. This process, however must be developed based on the particularity of each area and fishery and that all the important stakeholders are involved from the start of the process. This is a key factor in making any fisheries management plan successful.

WIDER ECOSYSTEM CONSIDERATIONS IN FISHERIES MANAGEMENT

4. In recent decades concerns about the collapse of fisheries, the uncertainty that underlines fisheries assessments and the recognition that management objectives do not relate solely to the fish stocks, has led to a diversification of fisheries science and management. For many years fisheries scientists have given advice that could be used to prevent overexploitation or collapse of a fish stock. However, the increasing intensity of fishing throughout the world has had impacts on the marine ecosystem, and other aspects than those on target species plus these impacts are now the focus of many

research and management programmes.

5. Over the past few years, new fisheries management approaches have been developed in response to concerns that weaknesses in present management practices have led to impoverished stocks, and caused conflicts between various stakeholders. In recent management approaches, there is an increased input from sociologists and economists who consider how different management strategies will affect the lives and incomes of fishers and associated communities. There is also a greater emphasis on the effects of fishing on the marine environment and the impacts on the species and habitats of conservation concern. In many fisheries activities, various fish, seabirds and marine mammals are caught on longlines or in nets when fishers are pursuing other species. Other concerns about the ecosystem effects of fishing focus on the impacts of towed gears on benthic fauna and habitats, the impact of fishers who use dynamite and poisons on coral reefs, and the effects of fishery waste on populations of scavenging birds and fish. In the past years in addition to these effects, what is known about them and what can be done to mitigate them are being considered and incorporated into fisheries management practices and plans.

THE IMPORTANCE OF DEVELOPING FISHERIES MANAGEMENT PLANS

6. Fisheries are managed because the consequences of uncontrolled fishing are undesirable. These consequences include fishery collapse, economic inefficiency, loss of employment, habitat loss and decrease in the abundance of rare species. Management is intended to maximize some specific biological, social or economic benefits from the fishery while minimizing costs.

7. If fisheries management is to work, the management objectives must be specified. Without clear objectives it is impossible to judge the success or failure of management or to design a management strategy. Fisheries could for example be managed to increase food production, income or employment, to conserve non-target species and habitats to placate lobbyists or to encourage fishers to vote for you. For many years the objectives of fisheries management was to maintain the Maximum biological Sustainable Yield (MSY; in weight), with limited concern for social, economic and environmental factors. In many cases this was assumed rather than specified.

8. In order to determine whether objectives are met, the manager will need indicators. When indicators are truly quantitative, in the sense that there is a threshold against which an indicator can be compared, it is much easier to judge the success of management. However it is rather difficult to judge the success of management when indications of any success or failure are based on the emotional setting of the fisheries manager or management authority. While some of these indicators are relatively easy to measure, it is much harder to set appropriate targets for them.

9. The objectives are not independent, and thus an attempt to meet one objective is likely to compromise one or more of the others. For example attempts to maximise catches from a trawl fishery that catches many species, may mean that many species are overexploited. Should catches, income and employment be sacrificed to save a species of conservation concern? Conservation groups may say yes and fishers would say no.

10. Most fisheries managers nowadays are faced with such problems. For example, governments may ask a manager to improve the profitability of a fishery. The manager asks fisheries scientists to run a bio-economic analysis and this demonstrates that profitability will increase if 20 large vessels are licensed to operate from a single port at the expense of the small scale fleet. However the larger vessels will provide fewer jobs than the numerous small boats that land catches in small harbours all along the coast, and representatives of fishing communities start lobbying the government. Government can be more concerned about that conflict with the fishers would result in bad publicity and jeopardise their chances of re-election, and can decide to allow 20 larger vessels to enter the fishery, but also subsidize small vessels so that they keep on fishing. The new policy is no longer based on the bio-economic model but attempts to meet non-quantitative economic, social and political objectives. Government would make such decisions by feel, based on consultation, scientific advice

and their own political goal. The end result is that too many vessels are chasing too few fish and overall profitability of the fishery falls even further. Most managers are dealing with multiple objectives, most of the time driven by the political situation in the country, which may be based on economic, environmental concerns and so on. In this respect, fisheries managers need a framework for making balanced decisions.

PRINCIPLES OF THE ECOSYSTEM APPROACH TO FISHERIES

11. A need was felt in fisheries management to initiate a process that would facilitate how to address the problems in fisheries, especially those faced by different stakeholder groups. An evolution was suggested by FAO to draw up guidelines for the application of EAF1, followed by a simplified version², a toolbox for implementation³ and a Handbook on preparation of EAF management plans⁴.

12. EAF was defined as a risk based management planning process rooted in the principles of sustainable development⁵. According to FAO⁶: “*An Ecosystem Approach to Fisheries strives to balance diverse societal objectives, by taking into account of the knowledge and uncertainties about biotic, abiotic and human components of ecosystem and their interactions and applying an integrated approach to fisheries within ecologically meaningful boundaries.*”

13. The above definition clearly indicate that EAF addresses both human and ecological well-being and merges two paradigms: that of protecting and conserving ecosystem structure and functioning and that of fisheries management that focus on providing food, income and livelihoods for people. Many feel intimidated by the perceived complexity of the ecosystem approach. However, none of the principles of the ecosystem approach are new and they can all be traced in earlier instruments and agreements (such as the UNCLOS, the Fish Stocks Agreement and the FAO Code of Conduct for Responsible Fisheries)⁷.

14. However implementation in the field of the EAF principles has lagged behind. The reasons for the delay in implementation are many and compounding. One aspect is related the distance between the discourse at the international level and what actually happens on the ground, and the lack of knowhow in order to transpose the international agreements into practice.

15. Another reason for this is that there is a wide perception that the application of the EAF principles in practice is extremely difficult due to the complex ecosystem, societal needs, and the politics involved. Furthermore there is a lack of investment in the process. EAF is a long-term commitment with long-term benefits, which may be difficult to present convincingly to governments which normally work in shorter cycles and tend to prioritize short term objectives as opposed to long-term goals. In many cases there is an insufficient participation of stakeholders since it may be extremely difficult to satisfy all of them. EAF planning often involves dealing with stakeholders with unbalanced level of information, power and political influence. Illegal stakeholder behaviour, through illegal fishing, lack of implementation of flag/port state responsibilities and misreporting are common impediments to the EAF approach.

16. The EAF approach can be considered as an attempt to build a bridge between the commitments and their actual implementation in order to solve the practical problems faced by fisheries. Although

¹ FAO,2003, The ecosystem approach to fisheries, FAO Technical Guidelines for Responsible Fisheries, Rome, Italy, 112.

² FAO, 2005, Putting into practice the ecosystem approach to fisheries, Rome, Italy, 76.

³ Fletcher WJ, Bianchi G,2014, The FAO – EAF toolbox: Making the ecosystem approach accessible to all fisheries, Ocean & Coastal Management 90, 20-26.

⁴ FAO 2016, Handbook of the EAF-Nansen project training course on the ecosystem approach to fisheries - Preparation and implementation of an EAF management plan. FAO EAF-NANSEN Project Report No. 28 EAF-N/PR/28(En), Rome, Italy.

⁵ Bianchi G, 2008, The concept of the ecosystem approach to fisheries in FAO (In: Bianchi G,Skjoldal HR, editors, The Ecosystem Approach to Fisheries) CAB International and FAO, 363.

⁶ FAO,2003, The ecosystem approach to fisheries, FAO Technical Guidelines for Responsible Fisheries, Rome, Italy, 112.

⁷ FAO 1995, Code of Conduct for Responsible Fisheries, Rome, Italy, 41.

there has been a lack in the implementation of the EAF principles, in recent years it was shown that implementing the EAF approach is not impossible and can be done in a practical and useful way as shown by many case studies around the world.

17. The EAF approach highlights and reorganizes the principles of sustainable development making their application more imperative. Key features of the EAF include:

- it is participatory, at all levels of the planning and implementation steps, in which the principle of equity are adhered to, i.e., fair distribution of rights between various stakeholders;
- it is based on a broader stakeholder participation in the management process, including data collection, knowledge building, option analysis, decision making and implementation;
- it is comprehensive by ensuring that all key components of the fishery system are taken into consideration, including those related to the ecological, social-economic and governance dimensions, while also taking into account external drivers;
- it encourages the use of the best available knowledge and the precautionary approach in decision-making, including both scientific and traditional knowledge. The lack of full scientific knowledge shall not be used as an excuse for postponing to initiate the EAF process;
- it promotes the adoption of an adaptive management system and stresses the importance of establishing mechanisms for feedback into the management process to improve the management performance based on past and present observations and experiences;
- it uses incentives as complementary management measures to support positive behavioural change;
- it promotes a risk assessment in management and a move from a predictive to an adaptive science framework, involving the use of methods to support decision making in conditions of high uncertainty.

EAF AND FISHERIES MANAGEMENT PLANS (FMPs)

18. The application of the EAF principles in the field works through the planning, setting up and implementation of a fisheries management plan. As defined by FAO⁸, a fisheries management plan is: *“a formal or informal arrangement between a fishery management authority and interested parties which identifies the partners in the fishery and their respective roles, details the agreed objectives for the fishery and specifies the management rules and regulations which apply to it and provides other details about the fishery which are relevant to the task of the management authority.”*

19. The management plan is the main instrument that specifies how management is to be conducted in the future. In many fisheries, management plans are often also instrumental not just for planning but for operational management. These plans do not just document the way to reach management goals in the future (strategic) but also describe how to manage the fishery in the present (tactical). Ideally a fisheries management plan is a formal document however it may also be a management arrangement that may be achieving the management objectives of a specific fishery but are not formally collated into a document called fisheries management plan.

20. One important aspect is the process by which a management plan is drawn up. There is little chance of success if the plan is not done with the full participation of the main stakeholders such as the fishers and those who interact with, monitor and police them. Although there is no blueprint for formulating a fisheries management plan, there are some basic elements that have to be included as suggested in FAO⁹. One important aspect of a fisheries management plan within the context of the EAF is the inclusion of all the components of the system, being ecological well-being, social well-

⁸ FAO, 1997, Fisheries management, Technical Guidelines for Responsible Fisheries No. 4, Rome, Italy,68.

⁹ FAO, 1997, Fisheries management, Technical Guidelines for Responsible Fisheries No. 4, Rome, Italy,68.

being and governance. The process of developing or modifying a management plan according to the EAF process requires a series of iterative steps to be carried out by managers or by a management body established for this purpose, with support and active participation of stakeholders. Four main steps have been defined for the EAF planning process. These are presented below.

21. **Step 1: Initiation and Scope:** The first step in undertaking a comprehensive planning process such as for EAF should begin with the formation of a project team (e.g. EAF National Task Group) and the development of a roadmap (see EAF toolbox). This should outline the key drivers (internal and external) for undertaking the process, the expectations and motivations of the proponents, document the relevant stakeholders, likely impediments, the human and financial resources available and the specific set of methods to be used. This can be a very brief document (e.g. for a small community-based fishery) or a very detailed and comprehensive project plan and analysis (e.g. for a major fishery sector) which can be used to obtain formal endorsement, political backup and operational support from the relevant stakeholders and decision-making authority (central or local) to proceed.

22. EAF planning should not proceed until there is a sufficient support and the scope of the exercise is at a practical level. A perceived lack of information should not, however, be used as an excuse to delay initiation because EAF deals with such situations. With agreement to proceed, it is essential to formally define the scope and scale of the fishing activities, communities and geographic areas that will (or will not) be covered by the planning process. This may require clarifying any uncertainties about which agencies have management responsibility for the area and/or ecological resources under consideration. This scoping should also identify the relevant societal/community values and high level objectives (e.g. fisheries, environment, economic, etc.) to be achieved and their hierarchy. These underpin the operational objectives targeted by management and affect which management options will generate better stakeholder compliance. All of these decisions plus summaries of any relevant background material should be documented in a baseline report.

23. **Step 2: Issue Identification and Prioritization:** Based on the agreed scope of the fishery and the community values to be achieved, the next step is to identify and examine all issues relevant to the fishery to decide where to focus the management system to generate the best community outcomes. To assist with this process, the issues can be separated into the three EAF component groups:

- i. Ecosystem wellbeing – All ecological “assets” (e.g. stocks, habitats, ecosystems) relevant to the fishery and the ecosystem where it occurs and the issues/impacts being generated by the fishery that may be affecting them.
- ii. Human wellbeing – The social and/or economic outcomes currently being generated by the fishery; both the good – those outcomes the community wants to have generated (e.g. food security, economic development), and the bad – those it wants to avoid (e.g. conflicts; injuries).
- iii. Ability to achieve – The management and institutional systems in place or proposed to deliver the wanted outcomes (e.g. access and tenure systems, compliance, democratic processes, conflict resolution, stakeholder participation), along with the external drivers (not controlled by the fishery) which may be affecting performance.

24. Because a large number of assets and issues can be identified, the key part of the whole EAF processes to ensure only the most important issues that are addressed by a direct management intervention. This requires determining their relative priority using some form of risk assessment and/or prioritization procedure based upon the fishery trying to deliver the hierarchy of community objectives and values, not just the ecological ones. Without effective prioritization of the identified issues, the remainder of the planning process will almost certainly fail.

25. **Step 3: Operational Objectives, Indicators and Management Options:** After identifying the issues (ecological, social, economic or institutional) which require direct intervention, the next step is to develop a management system that will deliver successful outcomes. This requires clearly

determining specifically what you want the fishery to achieve for each issue and why. These operational objectives need to be clear, measurable and directly linked to one or more of high level objectives.

26. To ensure each operational objective to be achieved, there is a requirement of some way of measuring if the management system is working or not. This involves having one or more indicators to measure performance, plus having performance measures (limits, targets, thresholds, etc.) that clearly describe what levels of the indicator define an acceptable performance. The operational objective, indicator and performance measure together form a package; none is useful without the others.

27. The other critical part of the management system is the determination of what combination of management measures will most likely achieve each of the operational objectives given the available resources and any other constraints. This involves assessing which of the current management arrangements have deficiencies or inefficiencies and identifying potentially better alternatives. Each option should be evaluated based on its cost effectiveness, impact on risks and objectives, likelihood of adoption, etc. to determine which is the most appropriate.

28. **Step 4: Validation, Implementation, Monitoring and Performance Review:** Implementing a new management system can be helped by generating an operational (or action) plan that outlines, in detail, what would need to be done by whom, by when, and where. This includes identifying all the activities that need to change, any additional activities needed, plus those activities no longer needed. The complete set of the required activities and their timelines with the resources available should show whether the proposed set of management arrangements is feasible or if they need to be revised.

29. When the feasibility of the system is confirmed, all proposed fishery management actions and arrangements need to be incorporated into a formal Fisheries Management Plan which has an appropriate legal basis. This can require drafting legislation, regulations or other less formal documentation depending on the country and the provisions made in its laws. Monitoring, evaluation and review of performance is a critical step in the adaptive management planning process. It is essential both to ensure adequate performance is being generated for current objectives and also that the fishery is maintaining relevance with community expectations. An important activity in the process is to regularly report the outcomes of the management system to all stakeholders so they can consider whether the performance against each of the objectives has been acceptable or not.

FISHERIES RESEARCH AND MANAGEMENT PROJECT – EAF-GULF PROJECT

30. Despite their recognized importance, the ability of marine ecosystems to continue providing a wide range of goods and services for billions of people is being threatened. Many fish stocks in the world continue to be over-exploited. The main threats to marine ecosystems, and related living marine resources and biodiversity are fisheries, pollution (including marine debris) from marine (including oil exploitation) and land-based sources, and climate variability and change, combined with limited capacity to manage these impacts and their compounded effects. Despite progress made in understanding these issues, the response to the pressures has been inadequate and negative trends in the health of marine ecosystems and associated resources have not been halted. The three key challenges that contribute to this situation are:

- Inadequate knowledge of the impacts of stressors such as fisheries, climate variability and change, and pollution on marine ecosystems and their social and economic consequences.
- Inadequate systems and practices for sustainable management of marine capture fisheries further challenged by climate and pollution impacts.
- Insufficient capacity in fishery and environmental research and management.

31. The limited capacity of countries in marine and fisheries research and management remains an overarching and cross-cutting challenge. Capacity development needs are broad and range from fishery-related data collection and analysis, fisheries management (including formulation of

management advice, harvest control rules, rights allocation, monitoring, control and surveillance, etc), policy formulation and development of appropriate legislation. Furthermore fish stocks and related ecosystems are often shared among neighbouring coastal countries, which requires collaboration and concerted effort among the countries concerned both in research and in management.

32. In September 2015, the United Nations General Assembly adopted the 2030 Agenda for Sustainable Development that includes 17 Sustainable Development Goals (SDGs). Building on the principle of “leaving no one behind”, the new Agenda emphasizes a holistic approach to achieving sustainable development for all. The year 2016 marks the first year of the implementation of the SDGs.

33. The Project will provide the necessary instruments to answer to the Sustainable Development Goal 14 (Life Below the Water): **Conserve and sustainably use the oceans, seas and marine resources for sustainable development.**

34. FAO has embarked in developing a Fisheries research and management project for the implementation of SDG 14 in order to address the specific needs of the Fisheries sector. The Project will strengthen country`s specific efforts to create conditions to assist in the achievement of sustainable food security through the application of the Code of Conduct for Responsible Fisheries (CCRF) and the Ecosystem Approach to Fisheries Management (EAF). It will support stakeholders in fisheries research and management institutions in their efforts to manage their fisheries in a sustainable manner. In order to contribute to the long-term objective of the Project, 4 Outcomes have been proposed along with several sub-outcomes and outputs. The expected overall Outcome of the Project is: **“Fisheries are sustainably managed, in line with EAF principles, considering climate and pollution impacts”**

35. **Outcome 1:** Fishery research and management institutions have the required capacity to collect scientific information in order to provide relevant and timely scientific advice for management.

Improved and broader knowledge of the likely present and future impacts of pressures on marine ecosystems is fundamental to enable coastal countries to take these impacts into consideration in their planning and management. The Project will strengthen the knowledge base required to respond to the challenges with innovative and supportive activities expected to address urgent as well as long-term strategic policy and management issues. In this respect, under this outcome, the Project is to continue providing data and information in support of sustainable fisheries management, in the environmental (e.g. oceanography, climate change and pollution), biological (e.g. growth, migration), ecological (e.g. habitat impacts, discards), Fleet statistics and dynamics, economic (e.g. value chain, trade, costs) and social areas (family values and culture).

36. **Outcome 2:** Fishery research and management institutions have the capacity to comprehensively analyze, present and publish scientific information, for an efficient management of the fisheries sector.

This component introduces the scientific advice required for fisheries management and develops the capacity of fisheries institutions and other relevant institutions to analyze the required data and information. Successful fisheries management requires an in depth and equal understanding of Fisheries environmental impacts assessments, Fisheries stock assessment, ecological modelling, bio-economic modelling, forecasting and management strategy evaluation among many other data analysis techniques. It will also establish a network that will work in close collaboration with national and regional institutions to promote the use of the data for the production of scientific knowledge and advice in support of management.

37. **Outcome 3:** Fisheries management institutions have the appropriate management processes and tools in place according to the EAF principles.

Under the Project, a systematic approach to the support will be taken in the development of comprehensive EAF fishery management plans, which will involve the establishment of a Fishery Management Cycle that consists of all the activities that a fisheries administration is expected to carry out annually as part of its mandate to manage the fisheries. These plans can guide the implementation of agreed management measures, as well as their adaptation in face of changing conditions, thus helping managers make more informed decisions for the sustainable use of fisheries resources.

38. **Outcome 4:** Partner institutions have the appropriate participation and institutional cooperation within the wider context of sustainable fisheries management in the Region.

Within the framework of the EAF, the participation and cooperation of stakeholders in the process of developing and implementing management plans within the wider context of fisheries management is a key element to the success of any management system. Cooperation at community, national and regional levels would bring together representatives from relevant stakeholder groups involved in the fisheries sector (e.g. fishers, traders, processors, cooperatives, government fisheries managers, scientists, etc.). The project will promote Regional cooperation and collaboration for fishery research, monitoring and management, and use expertise to enable contributions and responses to regional and global policies agendas.

At Regional level the project will promote and cooperate with governments and those programmes and institutions relevant to its scope, so as to ensure coordination and consistency and to seek additional strategic alliances of benefit to the long-term future of the project. The project will also collaborate with existing initiatives within Regional Bodies related to fisheries within the project area and beyond.

The activities defined in the Project are priorities for collaboration between countries, FAO and the partners in support of food security, sustainable fisheries management systems and development of national capacities. The identification of priorities and action areas are the result of initial consultations with relevant partners.

The Project is intended to support national policies, legislation and development goals. The Project will have a large number of stakeholders, including national fisheries, environmental management, and science/research institutions, fishing cooperatives and communities in participating countries, Regional Fisheries Bodies and related national, regional and international projects and organizations.

SUGGESTED ACTION FOR THE WGFM

39. Against the background outlined above, the WGFM is invited to discuss how EAF would be implemented more effectively in the RECOFI area and endorse the need to develop a fisheries research and management program in the Region (EAF-Gulf Project). The project would then be presented to the RECOFI Secretariat for endorsement after which potential donors could be contacted for funding in order to implement the Project in the RECOFI area.