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ESTABLISHING A BASELINE FOR THE IMPLEMENTATION OF AN ECOSYSTEM APPROACH TO MARINE FISHERIES MANAGEMENT IN WEST AND CENTRAL AFRICA

NANSEN PROJECT

Food and Agriculture Organization of the United Nations

THE EAF-NANSEN PROJECT

FAO started the implementation of the project “Strengthening the Knowledge Base for and Implementing an Ecosystem Approach to Marine Fisheries in Developing Countries (EAF-Nansen GCP/INT/003/NOR)” in December 2006 with funding from the Norwegian Agency for Development Cooperation (Norad). The EAF-Nansen project is a follow-up to earlier projects/programmes in a partnership involving FAO, Norad and the Institute of Marine Research (IMR), Bergen, Norway on assessment and management of marine fishery resources in developing countries. The project works in partnership with governments and also GEF-supported Large Marine Ecosystem (LME) projects and other projects that have the potential to contribute to some components of the EAF-Nansen project.

The EAF-Nansen project offers an opportunity to coastal countries in sub-Saharan Africa, working in partnership with the project, to receive technical support from FAO for the development of national and regional frameworks for the implementation of Ecosystem Approach to Fisheries management and to acquire additional knowledge on their marine ecosystems for their use in planning and monitoring. The project contributes to building the capacity of national fisheries management administrations in ecological risk assessment methods to identify critical management issues and in the preparation, operationalization and tracking the progress of implementation of fisheries management plans consistent with the ecosystem approach to fisheries.

Establishing a baseline for the implementation of an ecosystem approach to marine fisheries management in West and Central Africa

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PREPARATION OF THIS DOCUMENT

This is the report of a workshop organized by the EAF-Nansen project[1] in Accra, Ghana from 15 to 18 July 2013. The objective of the workshop was to examine the progress that countries in West and Central Africa have made with respect to the adoption and implementation of the ecosystem approach to fisheries (EAF). The initial materials for the report were provided by the staff of WWF South Africa, who also facilitated the workshop. All country teams that participated in the workshop made a number of contributions to the report.

[1] Strengthening the Knowledge Base for and Implementing an Ecosystem Approach to Marine Fisheries in Developing Countries (EAF-Nansen GCP/INT/003/NOR)

FAO EAF-Nansen Project/FAO, Projet EAF-Nansen.
Establishing a baseline for the implementation of an ecosystem approach to marine fisheries management in West and Central Africa/Etablissement des éléments de référence pour la mise en œuvre d'une approche écosystémique de la gestion des pêches maritimes en Afrique de l'Ouest et centrale.
FAO EAF-Nansen Project Report/FAO Rapport du projet EAF-Nansen. No.20. Rome, FAO. 2014. 89 p.

ABSTRACT

The EAF-Nansen project has assisted several countries in Africa to understand, adopt and use an ecosystem approach in the management of marine and coastal fisheries. The project has facilitated a number of Ecological Risk Assessment (ERA) workshops as part of the process of developing fisheries management plans. The ERA is a structured, transparent process that is used to develop a shared vision among stakeholders, and to clarify what is required to implement an ecosystem approach to fisheries (EAF) in a particular fishery. With the participation of other partners, the EAF-Nansen project has also used a tool to establish baselines for EAF implementation.

A workshop was held in Accra, Ghana from 14 to 18 July 2013 to examine the progress made by 13 countries in West and Central Africa (from Sierra Leone to the Democratic Republic of Congo) in the adoption and implementation of an EAF. The tracking tool was used for selected fisheries as a means of establishing a baseline for EAF implementation in each of the countries, and in the region as a whole. The workshop results demonstrated that all the countries of the region have incorporated a number of aspects of EAF in the management of selected fisheries, thereby recording some progress towards meeting the commitments made at the World Summit on Sustainable Development. However, prior to the workshop, these efforts by the countries had generally not been considered to constitute EAF implementation, owing to a lack of understanding of what EAF implementation actually entails.

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INTRODUCTION

Since the formulation and adoption of the Reykjavik Declaration on Responsible Fisheries in the Marine Ecosystem (FAO, 2001), and the subsequent commitments made by the international community to the use of an ecosystem approach in the management of fisheries (e.g. the World Summit on Sustainable Development, 2002) a number of countries worldwide are adopting this management framework.

According to FAO, the purpose of an ecosystem approach to fisheries is to plan, develop and manage fisheries in a manner that addresses the multiplicity of societal needs and desires, without jeopardizing the options for future generations to benefit from marine ecosystems (FAO, 2003). Therefore, the EAF framework reorganizes principles of sustainable development that, though present in existing international instruments, have been largely neglected in fisheries policy and in the practical management of fisheries.

Guidance and guidelines for the implementation of EAF are readily available, both from FAO and from certain national institutions. For example, FAO published Technical Guidelines for Responsible Fisheries, in support of the Code of Conduct for Responsible Fisheries (FAO, 1995); the associated simplified document "Putting into practice the ecosystem approach to fisheries" (FAO, 2005); and in Australia, the Ecological Sustainable Development Framework (Fletcher *et al*., 2002) guides the management of Australian fisheries. In spite of these efforts, in many parts of the world, progress with integrating EAF into fisheries management systems has been slow.

A significant challenge is to deal with the many complex issues facing fisheries management, including the difficulty of prioritizing and balancing seemingly opposing objectives. In many cases there are limited resources and capacity for fisheries management and implementing an EAF is often perceived as placing an additional burden on fisheries management agencies. It also appears that there is no common understanding of what EAF actually entails, and how it should be implemented.

With the collaboration of other institutions, e.g. the World Wide Fund for Nature (WWF) of South Africa and programmes like the South West Indian Ocean Fisheries project (SWIOFP) FAO – through the EAF-Nansen project's activities – has been assisting countries in Africa to improve understanding of EAF and assess its degree of inclusion in the management of fisheries. FAO, WWF and other partners have used Risk Assessment as a tool to provide a structured, transparent process to develop a shared vision among stakeholders and to clarify what is required to implement an EAF in particular fisheries. In Africa, a number of workshops have been organized with the purpose of introducing fisheries managers and scientists to the approach and assisting with the operationalization of the EAF concept. Many of these workshops have contributed to the setting of a baseline so as to track the progress of countries as they implement EAF. For example, to date about 30 workshops have been held in the Benguela Current Commission (BCC) area (mainly in Namibia and South Africa) to review the implementation of the EAF in various local fisheries. The outputs of these workshops have allowed for the development of a tool to track EAF implementation (Paterson and Petersen, 2010). The results of the workshops have also been used to stimulate the implementation of EAF, establish a baseline and track the implementation of an ecosystem approach to the management of marine fisheries.

The tool that has been developed from the experience gained in the BCC region (hereafter called "the Tracking Tool") was used at a regional workshop held in Pretoria, South Africa in 2011. This workshop was attended by member states of the South West Indian Ocean Fisheries Commission area, i.e. countries in eastern Africa and the adjacent island states. The objective of the workshop was to set a baseline to track the implementation of EAF in each of the countries of the region.

From 15 to 18 July 2013, a workshop with the same objective was held in Accra, Ghana. This workshop involved 13 countries in the CECAF (Fishery Committee for the Eastern Central Atlantic) South area, i.e. all the countries in West and Central Africa from Sierra Leone in the north to the Democratic Republic of Congo in the south.

METHODOLOGY

The Accra workshop was attended by 36 participants from nine countries namely, Sierra Leone, Liberia, Côte d'Ivoire, Ghana, Togo, Benin, Nigeria, Cameroon, Gabon, Equatorial Guinea, Congo, São Tomé and Príncipe and the Democratic Republic of Congo (DRC). Workshop participants are listed in Appendix 1 and the countries of the region are shown in Figure 1.

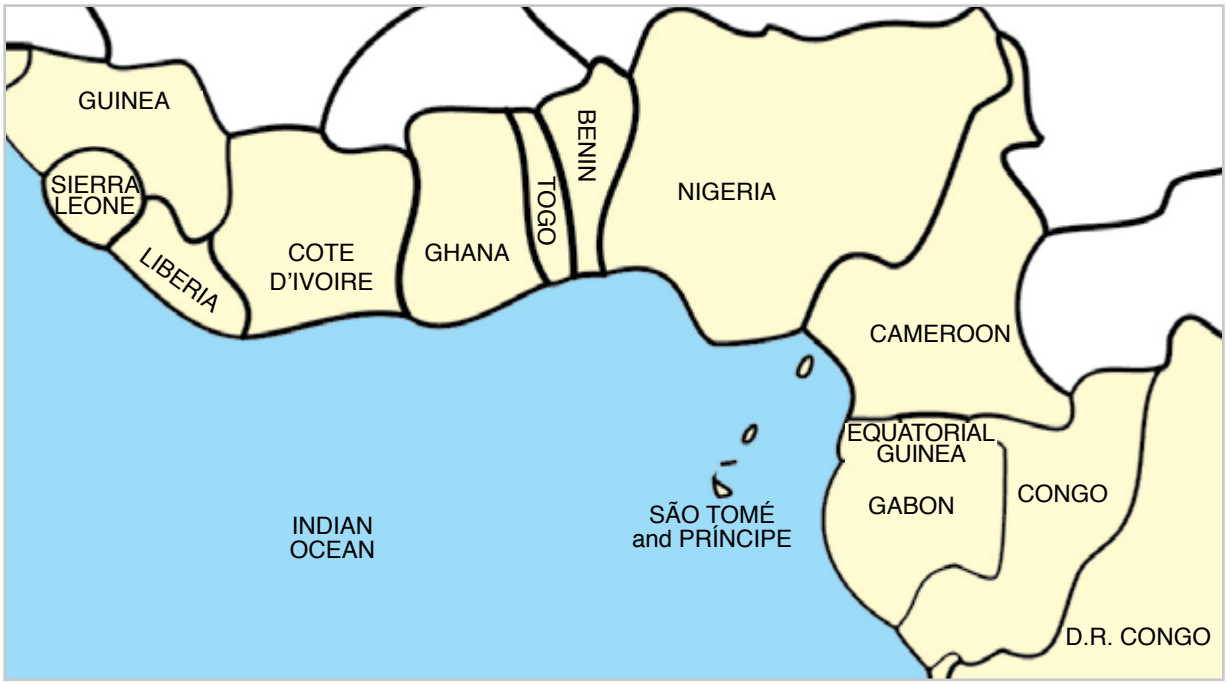

Figure 1. Map of West Africa showing the countries included in the study

In preparation for the workshop, a questionnaire (Appendix 2) was sent to the focal point institutions of the EAF-Nansen project in each country. The purpose of the questionnaire was to gather background information on a selected fishery. The questionnaire could be used for a single species fishery (e.g. industrial shrimp fishery) or a collection of multi-species, multi-gear fisheries (e.g. the artisanal fisheries sector). Through a consultative approach involving national fishery managers, scientists and stakeholders, the focal institution reviewed progress against ten EAF objectives, divided into sub-objectives for the fishery that they had selected (Table 1). The objectives and sub-objectives covered the generic component trees used for issue identification under EAF (Figure 2) and are also depicted in Appendix 3.

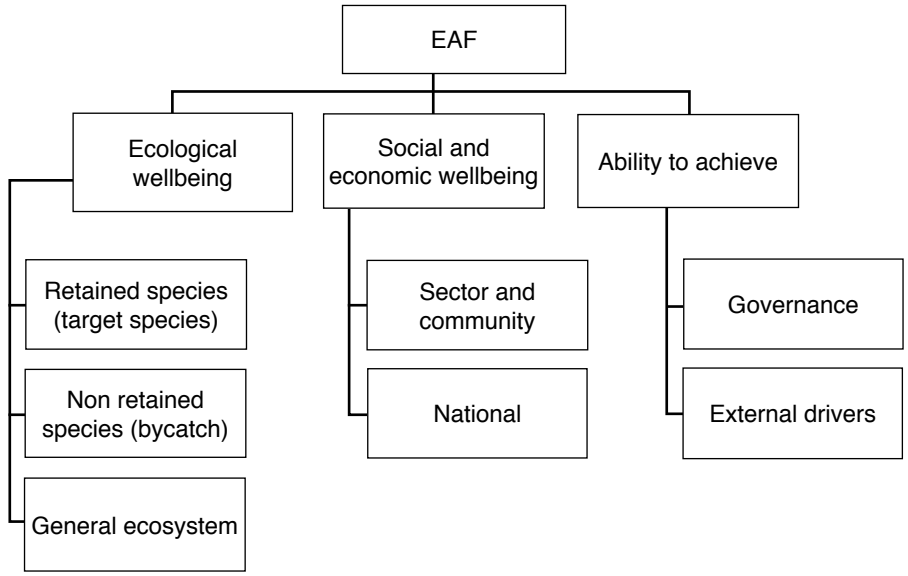

Figure 2. A generic component tree for issue identification under the EAF framework

At the workshop the fisheries that the countries had worked on were grouped for ease of discussion as follows:

Group 1: Small-scale or artisanal fisheries (Sierra Leone and Liberia)
Group 2: Coastal small pelagic fisheries (Côte d'Ivoire)
Group 3: Beach seine fisheries (Ghana, Togo and Benin)
Group 4: Industrial shrimp fisheries (Nigeria and Cameroon)
Group 5: Industrial shrimp fisheries (Gabon, Equatorial Guinea and the Republic of Congo)
Group 6: Small-scale or artisanal fisheries (São Tomé and Príncipe and Democratic Republic of Congo)

For the purpose of the analyses, the six groups were merged into the following three categories:

Category 1: Small-scale or artisanal fisheries – including the coastal small pelagic fishery of Côte d'Ivoire and excluding beach seine (Sierra Leone, Liberia, Côte d'Ivoire, São Tomé and Príncipe and Democratic Republic of Congo);
Category 2: Beach seine fisheries (Ghana, Togo and Benin); and
Category 3: Industrial shrimp fisheries (Cameroon, Republic of Congo, Equatorial Guinea, Gabon and Nigeria).

At the workshop, the participants worked in six groups, as described above, although each country team worked on its own fishery. The results were reported at a plenary session for the purpose of broader scrutiny and verification.

The EAF implementation status for each fishery was assessed using a modification of the EAF Tracking Tool (Paterson and Petersen, 2010). This tool tracks EAF implementation against ten objectives, each of which is further divided into sub-objectives (Table 1).

Table 1. Ten EAF objectives

1. The managing authority has a good understanding of the ecosystem impacts of fisheries including target, non-target and general ecosystem impacts.
2. Ecosystem impacts of fisheries, including target, non-target and general ecosystem impacts of fisheries, are included in management advice.
3. The social well-being of those who directly or indirectly depend on fishing is accounted for in management advice.
4. The economic well-being of the fishing industry is maintained.
5. The managing authority has transparent and participatory management structures that ensure good communication and information sharing locally and regionally.
6. Management plans incorporate EAF considerations.
7. Compliance with regulations reduces ecosystem impacts of fisheries.
8. Sufficient capacity, skills, equipment and funding exist to support the implementation of an EAF.
9. Good data procedures exist to support EAF implementation.
10. External impacts of fisheries are addressed (e.g. the effect of other sectors, other industries, climate change, etc.).

For each objective a seven step generic process is described. The seven step process delineates the route towards achieving each objective. For example, for Objective 1 (the managing authority has a good understanding of the ecosystem impacts of fisheries including target, non-target and general ecosystem impacts), the seven steps are:

Step 1: no research programme initiated or needs identified;
Step 2: research needs/issues have been identified and prioritized;
Step 3: research programme to address needs is in place;
Step 4: research programme provides minimum results which are incorporated into stock assessment;
Step 5: research programme adequately addresses priority needs and results are incorporated into stock assessment;
Step 6: research programme is producing comprehensive results beyond priority needs and most of these are incorporated into the stock assessment;
Step 7: research programme is producing comprehensive results beyond priority needs and most of these are incorporated into the stock assessment and are regularly published in peer reviewed reports/papers.

For each objective and sub-objective, participants were required to discuss and agree on the step their selected fishery could be said to be at. The status of implementation was then calculated for each objective as the percentage of the step selected against a maximum score or the final step 7. The participants also identified key areas of success, as well as challenges and possible barriers to progress, in the implementation of the ecosystem approach to fisheries.

RESULTS AND DISCUSSION

The results presented and discussed here are based on the perception of the participants at the workshop and may not necessarily be the best assessment of the situation of the fishery. However, since all the participants were senior managers and researchers, it may be comfortably assumed that their opinions and collective assessment are close to the reality. The objective of the analysis is not to compare the results for the various countries, but rather to stimulate EAF implementation in each of the countries and to identify related opportunities and challenges.

OVERALL LEVEL OF IMPLEMENTATION

The score for the individual objectives ranges between 30 percent for Objective 1 (managing authority has a good understanding of the ecosystem impacts of fisheries) and 53 percent for Objective 5 [The managing authority has transparent and participatory management structures (Fig. 3)]. This shows that, in general, fisheries management authorities in the region have transparent and participatory management structures that ensure good communication and information sharing locally and regionally. The lowest scoring objective implies that the fisheries management authorities do not have a good ecological understanding of the resources and the ecosystem on which they impact. This is not surprising because many of the countries in the region do not have good marine research facilities and/or adequate funding, skills and capacity for the task. The overall score for EAF implementation across the 13 countries, with all ten objectives considered, is 37 percent.

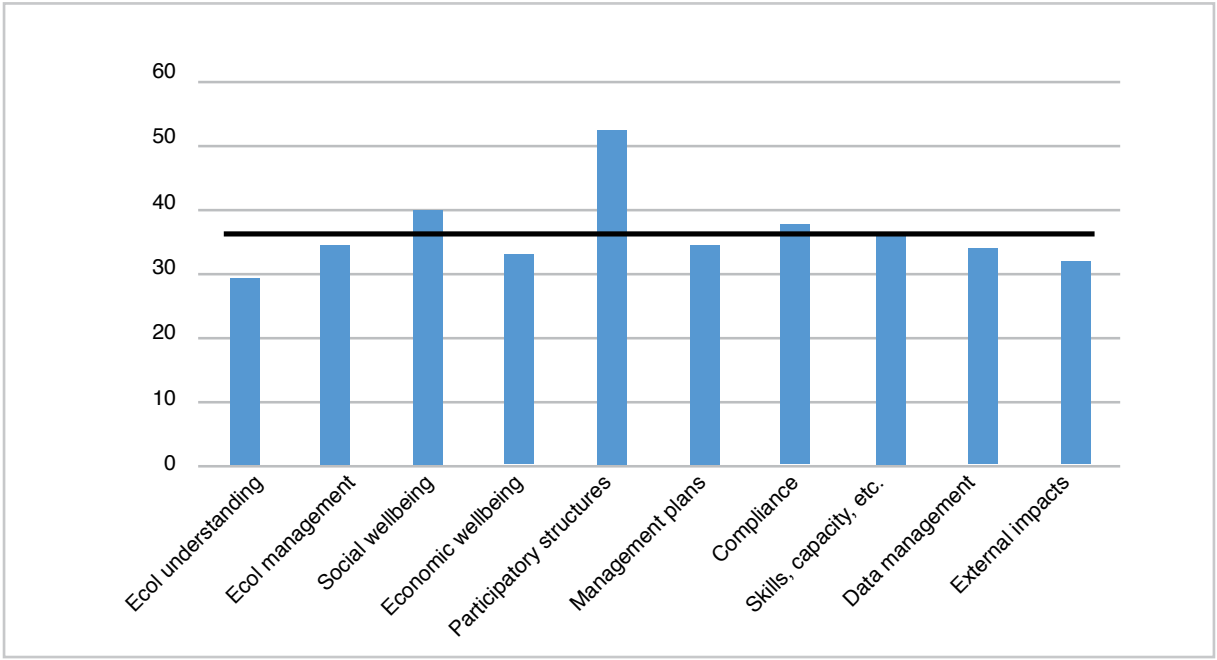

Figure 3. The overall EAF implementation for the subregion shown as a percentage and summarized by the ten EAF objectives and averaged across fisheries

Considering the World Summit on Sustainable Development (WSSD) recommendations and the implementation of the FAO Code of Conduct for Responsible Fisheries, notable areas of relative progress towards EAF implementation in the subregion include the development of management plans, especially with the support of the EAF-Nansen project; the proclamation of Marine Protected Areas (MPAs) in some countries; the delineation of fishing zones; the establishment and enforcement of closed seasons; and the deployment of turtle excluder devices (TEDs) in the shrimp fisheries. All the countries have taken steps towards considering the social well-being of the fishers and other actors involved in the fishery, mainly through national/fishery development plans which focus on poverty alleviation and food security. Gabon has developed community centres for fishers to embark on alternative livelihoods so as to improve the living standards of fishers. Some of the governments have also taken essential steps to empower the fisheries community to exercise some form of management control over the local fishery. For example, Sierra Leone has devolved canoe licensing to the community level.

However, significant challenges for EAF implementation remain, most notably a lack of funding, skills and capacity to carry out the required activities and enforce the necessary measures. The lack of funding and skills is felt particularly in Objective 1 (research) and Objective 7 (monitoring, control and surveillance). Owing to a lack of skills, capacity and funding, countries are not able to carry out the research that is required to provide scientific advice to management authorities and ensure that resources are exploited in a sustainable manner. Furthermore, Monitoring Control and Surveillance (MCS) is not functioning effectively in any of the countries. The areas of strength and the challenges faced are generally experienced across the whole region and are not specific to any of the fisheries or countries included in the study.

During workshop discussions, participants identified a number of overarching actions required to further the implementation of an EAF in the region. First and foremost, capacity building is needed in almost all countries to further develop the common understanding of EAF and how it can be mainstreamed into fisheries management. Workshop participants acknowledged the key role that the EAF courses organized by the EAF-Nansen project, in partnership with some universities in Africa, have played in this regard and requested that these courses be up-scaled and offered more widely, including at national level. Further key action points include: conduct or continue key research activities; improve the training of fisheries observers; and improve MCS capacity in the region.

It was noted that, although the EAF-Nansen project has provided many opportunities to ensure/facilitate implementation of the ecosystem approach to fisheries in Africa, there is still a need for policy and/or institutional reform in many of the countries so that they may take full advantage of these opportunities. There needs to be a formal mainstreaming of EAF into existing institutional structures, as well as a proactive move towards implementation of the ecosystem approach to fisheries. Some of the countries expressed concern over the increasing conflict between fisheries and the oil and gas industry. It was suggested that proactive spatial planning is required to enable the two sectors to co-exist amicably. Finally, opportunities for alternative livelihoods were discussed as a way of reducing reliance on already overexploited resources.

The overall implementation score for each of the 13 countries is shown in Figure 4. The countries in the same category of fishery are arranged together. The scores per category and for each objective are shown in Figure 5. Figure 4 shows marked differences in the implementation scores between the 13 countries. Significant differences occur between the five countries that considered EAF implementation in the small-scale fisheries, whereas the three countries that looked at beach seine fisheries are almost all at the same level of overall implementation. In the shrimp fisheries category, Gabon has the highest overall score, followed by Nigeria. All three countries have been assisted by the EAF-Nansen project to develop a management plan for their respective industrial shrimp fisheries.

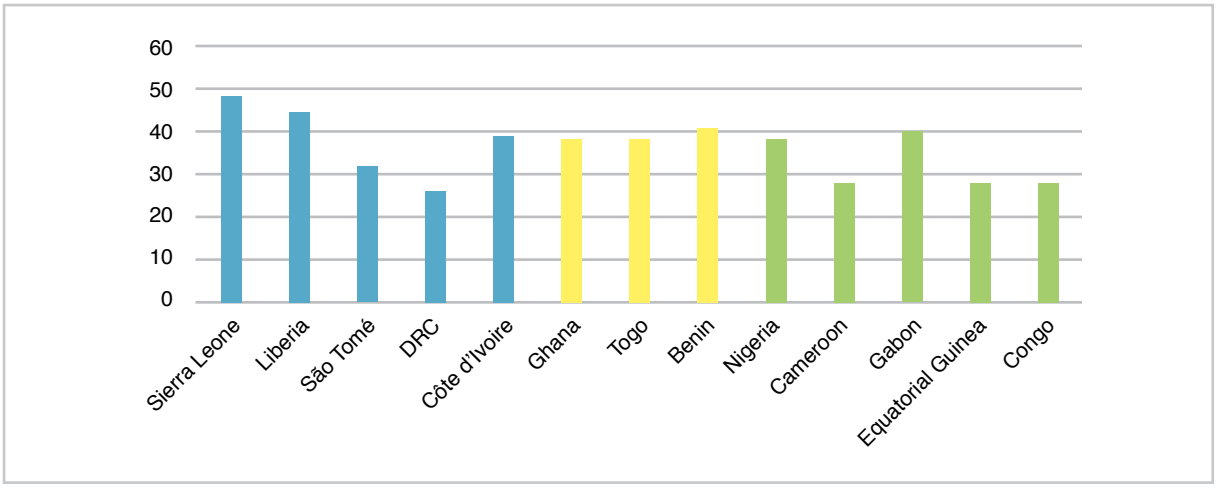

Figure 4. EAF implementation score for each of the 13 countries averaged across the ten objectives

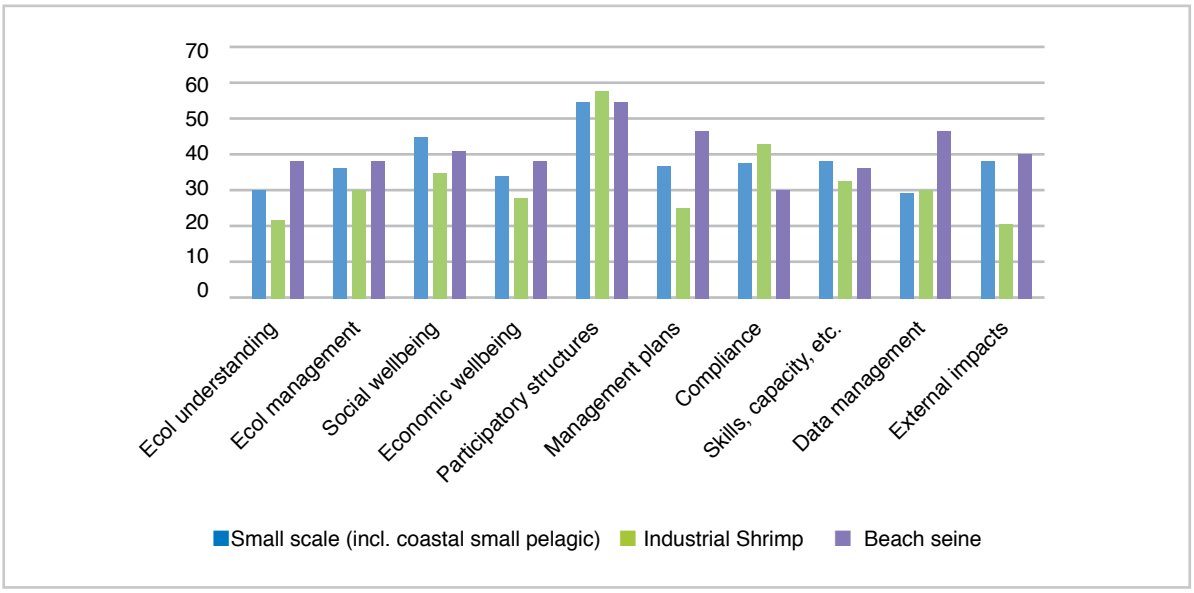

Figure 5. Overall EAF implementation by objective and in each category

KEY OUTCOMES PER OBJECTIVE

The results for each objective are further described below.

Objective 1: The managing authority has a good understanding of the ecosystem impacts of fisheries including target, non-target and general ecosystem impacts

There are differences in the understanding of the ecosystem impacts of the fisheries in question. A big challenge for most of the countries is a lack of research facilities or collaboration with universities conducting research. One would expect that for the industrial shrimp fisheries, where bycatch is a major issue, the managing authority would have a relatively better understanding of the ecosystem impact of the fishery. On the contrary, the results of the analyses show that this group of countries has limited understanding of the ecosystem impacts of fishing, in spite of the high levels of bycatch in the sector. This is surprising because, of the five countries that worked on shrimp fisheries, only Cameroon did not implement the law on the use of TEDs and Bycatch Reduction Devices (BRDs).

The workshop revealed that there is some understanding of the spatial distribution of shrimps, spawning areas, predator-prey relationships, gear loss and ghost fishing. The results also show that the beach seine countries have a relatively better understanding of the impacts of the fishery on the ecosystem compared to the other sectors considered by the workshop.

Objective 2: Ecosystem impacts, including target, non-target and general ecosystem impacts of fisheries, are included in management advice

The countries that participated in the workshop had incorporated ecosystem considerations into management to varying degrees. For instance, in the small-scale fisheries sector, including the beach seine fishery, the entire catch is retained and therefore bycatch is not considered to be an issue. However, the proportion of juvenile fishes in the catch is likely to pose a challenge for fishery resources in general. In Ghana, the authorities are considering ways of improving the beach seine gear so that it has less impact on juvenile fishes. Many of the countries have regulations on fishing zones, MPAs or closed seasons which address the issue to some degree.

In the shrimp fishery where bycatch is a key issue, none of the countries is implementing any comprehensive bycatch reduction measures, other than the use of TEDs. Gabon closes its shrimp fishery for four months every year to allow the stock to recover. The other countries are limited in their ability to enforce regulations owing to a lack of funds or capacity for MCS.

Objective 3: The social well-being of those who directly or indirectly depend on fishing is accounted for in management advice

This objective evaluates the understanding of fisheries managers of the role of the fisheries sector in addressing poverty, including the sector's contribution to food security, employment, health and education. It also assesses whether these issues are considered in management plans and whether policies and appropriate management actions are taken to effect appropriate management. Good progress was recorded for this objective in most of the countries, except São Tomé and Príncipe, Togo and Cameroon. Most of the countries have national plans for poverty alleviation which address issues of food security and community development. However, many of the plans are for all sectors of the economy and specific actions for the fisheries sector are not clear or adequate. In the industrial shrimp fisheries, most of the fishing is conducted by foreign vessels and therefore little attention is paid to the social well-being generated by this sector.

Objective 4: The economic well-being of the fishing industry is accounted for in management advice

In the subregion, the economic role of the fishing industry is generally understood, even in the oil-rich nations of Nigeria, Equatorial Guinea and Gabon. However, many of the components of this objective – eco-labeling, traceability of fishery products, strategy for market security – are not strictly applicable to most of the fisheries in the subregion. Furthermore, none of the countries has used the allocation of individual rights as a management tool. Although fishery management agencies consider job security for all people involved in the fishery as a priority, it is questionable whether the long-term financial stability of fishing companies and entities is really a management objective in any of the countries.

There appears to be no clear pattern in the scores for this objective. For example, in the industrial shrimp fisheries some countries have preferential fuel prices and a number of countries have fishery development or management plans that take the economic well-being of the fishery into account, but most of the plans were still under development at the time of the workshop. Countries such as Sierra Leone, Liberia and Côte d'Ivoire are introducing a rights-based system of fishery management. As in the previous objectives, the shrimp fishery sector scored least among the three categories under consideration.

Objective 5: The managing authority has transparent and participatory management structures that ensure good communication and information sharing locally and regionally

Many of the countries scored relatively highly for this objective which implies that there are good structures in place for communication within government and between fishery management agencies and the fishing industry. It is the only objective where each category of countries scored over

50 percent for implementation. In this subregion, traditional fisheries management that includes the role of community chief fishers, is very important. Many of the governments have taken advantage of such traditional structures to reach out to the industry. Each of the countries is a member of at least one of the regional/subregional fishery bodies, namely CECAF, Regional Fisheries Committee for the Gulf of Guinea (COREP), Fishery Committee for West Central Gulf of Guinea (FCWC) and the International Commission for the Conservation of Atlantic Tunas (ICCAT).

Objective 6: Management plans incorporate EAF considerations

Of the 13 countries in the region, only São Tomé and Príncipe, DRC, Equatorial Guinea and Congo did not have any management plans for their fisheries in place at the time of the workshop. All the other countries have at least one fishery management plan at various stages of development. The low overall score for the shrimp fishery category is surprising considering the fact that three of the five countries are being assisted by the EAF-Nansen project to develop a management plan for their respective shrimp fisheries.

Some of the countries have prepared, adopted and are implementing National Plans of Action (NPOAs) especially for Illegal, Unregulated and Unreported (IUU) fishing and for sharks. Others do not have any NPOAs or do not have immediate plans to develop NPOAs.

Objective 7: Compliance with regulations reduces ecosystem impacts of fisheries

The scores for this objective varied greatly between the countries, from DRC with below 20 percent to Gabon with above 60 percent. Gabon has a good and functioning MCS system in place with an operational Vessel Monitoring System (VMS). There are also patrols at landing facilities. However, the objective does not only consider the presence or absence of MCS but also the reduction of ecosystem impacts of the fisheries as a result of compliance with rules and regulations.

All 13 countries noted lack of funding as the most important factor limiting the implementation and effectiveness of MCS.

Objective 8: Sufficient capacity, skills, equipment and funding exist to support the implementation of an EAF

An issue that was raised across the whole subregion was the limited funding, skills and capacity to effectively implement an EAF. This limitation affects all aspects of EAF implementation, including research, management and MCS. An important factor for the countries is the lack of understanding of what EAF is (or is not) and the process by which it may be mainstreamed in management. The participants requested the EAF-Nansen project to organize an awareness raising workshop for senior policy and decision-makers in the subregion.

Objective 9: Good data procedures exist to support EAF implementation

Generally the countries in the subregion do not have good data procedures in place for effective EAF implementation. In many of the countries, the collection and management of fishery statistics is inefficient and in some instances – especially for artisanal fisheries – non-existent. In the case of the industrial shrimp fisheries, the accuracy of some landing declarations is questionable, logbook information is believed to be inaccurate and the data does not adequately inform research and management of the sector. Additionally, the data collected are only on landings and very little data and information on social and economic issues are collected by fisheries agencies. The countries with high scores in this objective, e.g. Ghana, Togo and Nigeria, do have systems for the collection and processing of fishery dependent data and information. None of the countries has good electronic data management systems for EAF implementation.

Objective 10: External impacts of fisheries are addressed (e.g. the effect of other sectors, other industries, climate change, etc.)

In general, although the 13 countries have some idea about certain external factors that affect their fisheries, very little verified information on these impacts is available. This is especially true for climate change. However, it is surprising that the score for the shrimp fisheries category was the lowest of

the three. There is a need for improved research to increase the understanding of external impacts on fisheries. All the countries noted that the fishers are generally aware of the impact of changing fuel prices on their sector because this directly affects the cost of their operation, profits and incomes.

Some countries expressed a concern over the interaction between fisheries and the oil and gas industry which is developing fast across the whole subregion.

KEY OUTCOMES PER CATEGORY AND COUNTRY

Small-scale fisheries

The small-scale fisheries category was made up of Sierra Leone, Liberia, Côte d'Ivoire, São Tomé and Príncipe and the Democratic Republic of Congo. In the workshop, the coastal small pelagic fishery of Côte d'Ivoire was placed in a separate category, but it was thought appropriate to include it in the small-scale group for the purpose of making effective comparisons. The resultant category does not include the beach seine fishery even though in the region under consideration this is also a small-scale fishery. This is because the beach seine fishery is rather distinct in that it is not conducted with any other small-scale (artisanal) fishing method.

Sierra Leone

The Sierra Leonean small-scale artisanal fishery is an open access fishery which operates in estuaries, bays, lagoons and inshore waters up to 45 km from the coast. The only form of control is through the licencing of canoes which is conducted by the local communities or the Ministry of Fisheries, Marine Resources and Aquaculture. The main fish species targeted by this fishery are snappers, groupers, barracudas, croakers and some small pelagic species. Many of these species are considered fully or overexploited in the region. Various types of canoes, of different sizes classes, are used in this fishery. They range from one-man canoes which are used for hand line, hook and line fishing, cast net and gillnet fishing; to the standard five to ten-man canoe and the Ghana-type canoe which is motorized and can be used for ring netting, bottom set gillnetting, surface drift netting or bottom drift netting; these canoes are being re-considered and may be reclassified as semi-industrial canoes. The small-scale fishery in Sierra Leone is the main source of production for local markets. Small-scale catches amounted to 244 000 tonnes in 2009 (total fish production for Sierra Leone was 263 000 tonnes in 2009) and contributed about 10 percent of GDP.

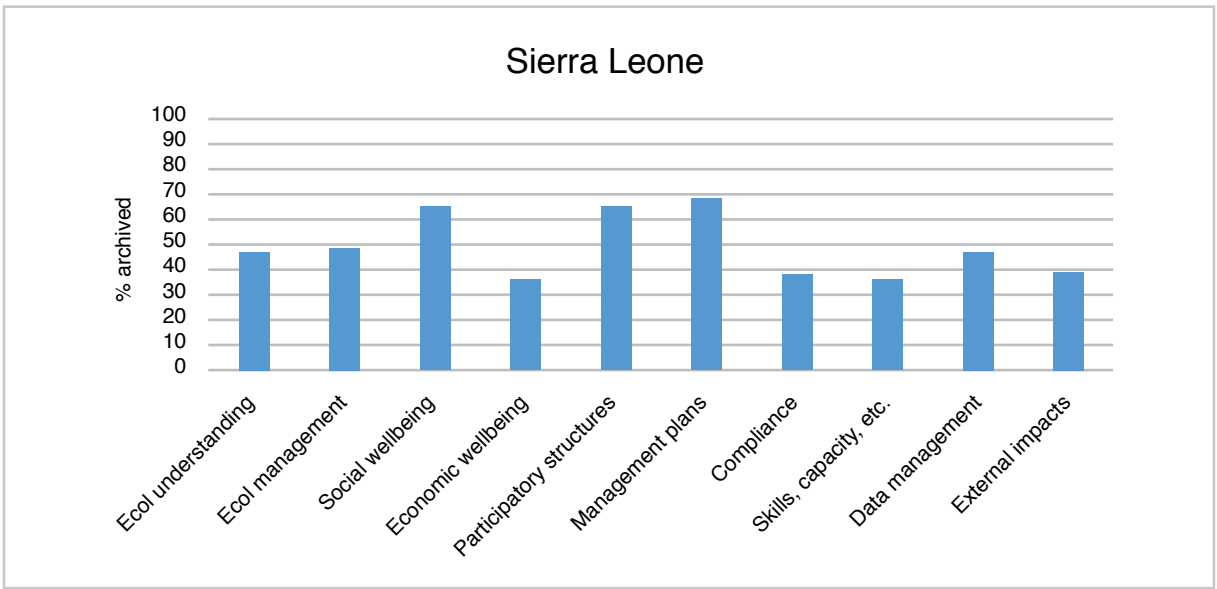

Figure 6: EAF implementation in the small-scale fishery of Sierra Leone

The overall level of implementation achieved is 49 percent (Figure 6). The most noticeable areas of good EAF implementation are in the objectives regarding social well-being, participatory structures and management plans, which all recorded scores above 60 percent. A management plan for this fishery that includes EAF considerations has been developed. At the time of the workshop, this plan was awaiting validation and then implementation. With reference to the social well-being of the fishing communities, Sierra Leone has implemented community-based management by devolving the licencing of fishing canoes to the local councils. In addition, the artisanal sector has been organized into community management associations (CMAs) which will eventually be responsible for managing marine protected areas. This has been made possible by good communication channels and effective associations being in place (Objective 6: participatory structures).

However, even with these good structures in place, inadequate skills, capacity and funding for compliance, research and management hinder Sierra Leone's move towards full EAF implementation in the small-scale artisanal fishery. There is a need for skills development in all areas of management (including research and compliance) if there is to be an improvement in these areas.

Liberia

The small-scale fishery in Liberia is made up of local and foreign fishers all targeting species within the six nautical mile Inshore Fishing Zone (IFZ). The local fishers, indigenous *Kru*, generally target fish closer to shore because they operate non-motorized canoes, whereas foreign fishers tend to have motorized canoes and can access fish further offshore. Some of the motorized canoes fish outside the IFZ. These are classified as semi-industrial canoes and they record a much larger catch per trip than the indigenous *Kru* canoes. The main species targeted by all artisanal fishers are *Clupeidae (poojor, gbapleh*, sardinellas), anchovy, chub mackerel (Scomber japonicas), carangids, barracuda, some tuna species and a range of demersal species (*Sparidae, Lutjanidae, Muliddae, Pomadasydae, Serranidae* and *Polynemidae*).

The fishery is managed by the Ministry of Agriculture and the Liberian Maritime Authority with the involvement of various other agencies and organizations. Small-scale fisheries play a key role in the livelihood of the coastal population, directly employing about 33 000 people, 11 000 of whom use approximately 3 500 canoes, less than 10 percent of which are motorized. The remaining 22 000 people are fishmongers, processors and suppliers of fishing equipment and gear. The majority of fishmongers and processors are women. The small-scale fishery contributes 60 percent of the total fish production of Liberia.

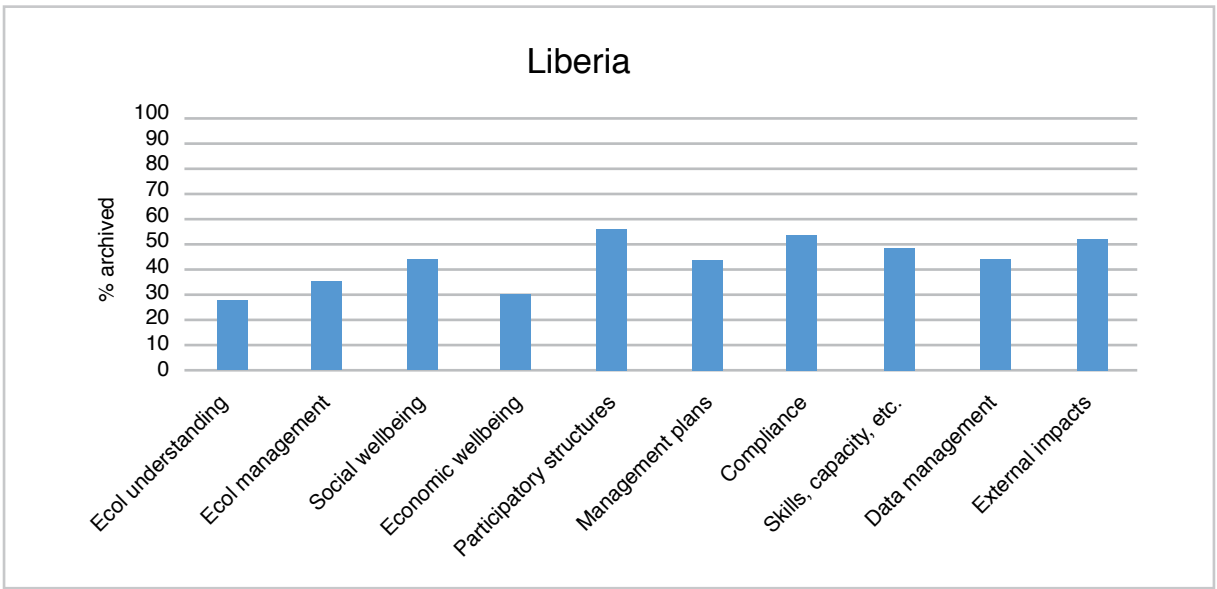

Figure 7: EAF implementation in the small-scale fishery of Liberia

Liberia's average level of EAF implementation was 44 percent, with a range between 28 and 57 percent (Figure 7). In terms of the highest scoring objective (Objective 5), there are good and regular communication channels in place between different government agencies and with the fishing industry. Although there is room for improvement, this is seen as one of the better implemented objectives. Liberia has succeeded in implementing shore-based monitoring and some sea patrols are also conducted. For Objective 1 (ecological understanding) Liberia has data on various aspects of stock status and other ecosystem considerations, but this has yet to be analysed.

Côte d'Ivoire

The Côte d'Ivoire coastal small pelagic fishery targets small pelagic fish with purse seine gear. It is an artisanal fishery but also has some small, semi-industrial vessels operating alongside the artisanal fishing crafts. The fishery is managed by the Directorate for Aquaculture and Fisheries through a licencing system in which individual rights are granted.

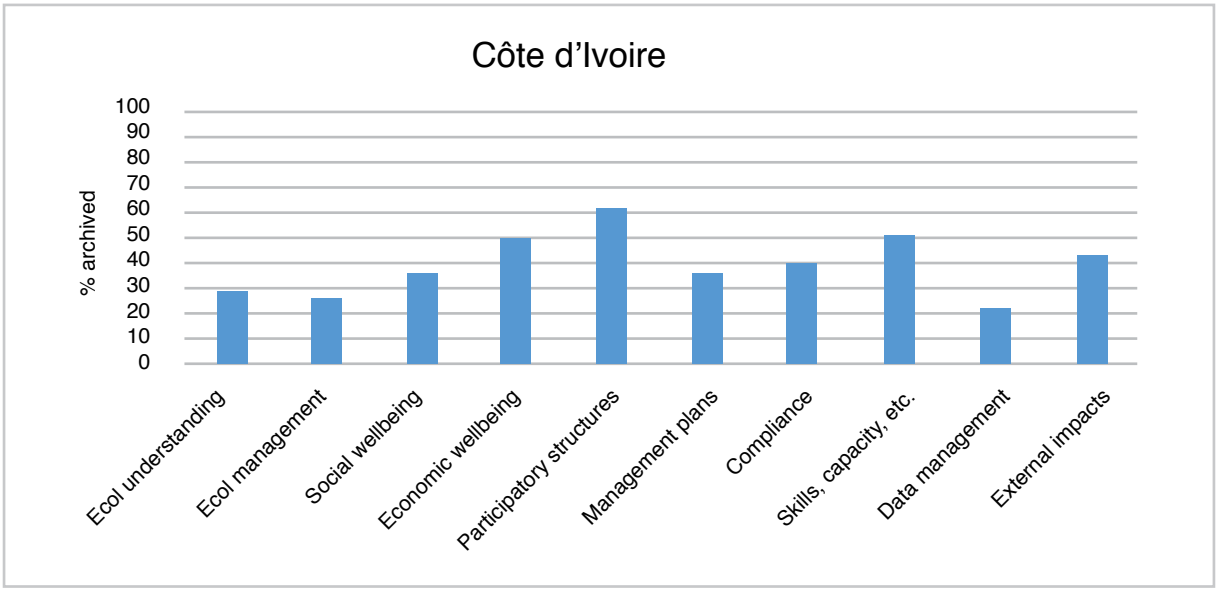

Figure 8: EAF implementation in the coastal small pelagic fishery of Côte d'Ivoire

Côte d'Ivoire achieved an overall average implementation score of 39 percent across all ten objectives, with scores ranging from 21 percent (Objective 9) to 61 percent (Objective 5; Figure 8). In terms of data management, Côte d'Ivoire has no observer programme and no electronic data management system. There are good participatory management structures in place with a functional task force that implements management recommendations. For example, several task forces have been put together to manage MPAs and a bill is being presented to parliament with a view to implementing spatial management within the fishery. There is a two nautical mile zone reserved for artisanal fisheries. The country has also implemented a law that stipulates no organic materials may be discarded at sea and plastic has been banned from fishing practices. Occasionally, research surveys are carried out in the waters of Côte d'Ivoire, mainly in the context of regional/subregional projects, and the results are taken into account in management advice. There is an economic development plan for the country in which socio-economic issues such as poverty alleviation and food security, are dealt with. There is a need for improved collaboration with other sectors that impact on the ocean.

São Tomé and Príncipe

São Tomé and Príncipe's overall EAF implementation score was 32 percent with individual scores ranging from 21 to 47 percent (Figure 9). São Tomé and Príncipe is a small country that lacks the resources to carry out research on its own. There has been some research conducted in the past and the country's waters are also covered in regional surveys, e.g. by the R/V *Dr Fridtjof Nansen*.

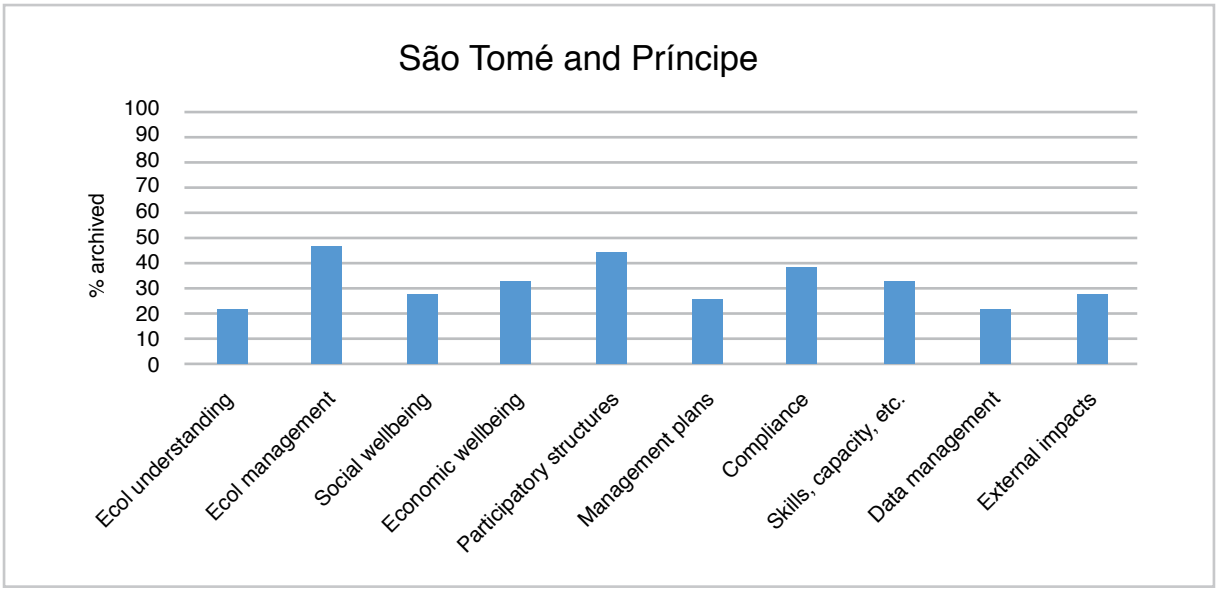

Figure 9: EAF implementation in the small-scale fishery of São Tomé and Príncipe

Training has been conducted through the EAF-Nansen project but there is little funding and capacity to put this training to use. The area where the country is situated is very vulnerable to IUU fishing activities and the government is working closely with national and international organizations to address this. Even though Objective 2 (ecosystem impacts) and Objective 5 (participatory structures) achieved the highest scores, much improvement is required in both these areas. In terms of EAF considerations being included in management, there are laws to regulate the fishery (including adherence to demarcated fishing zones) but, owing to a lack of funds, these are not implemented. There are industry associations in place and training has been undertaken but there is very little activity in terms of meetings and very little communication between government departments and the fishing industry.

Democratic Republic of Congo

In the Democratic Republic of Congo (DRC), the fishery is regulated by licences but these are only available in areas where there are officials; in other areas the fishery is effectively an open access one.

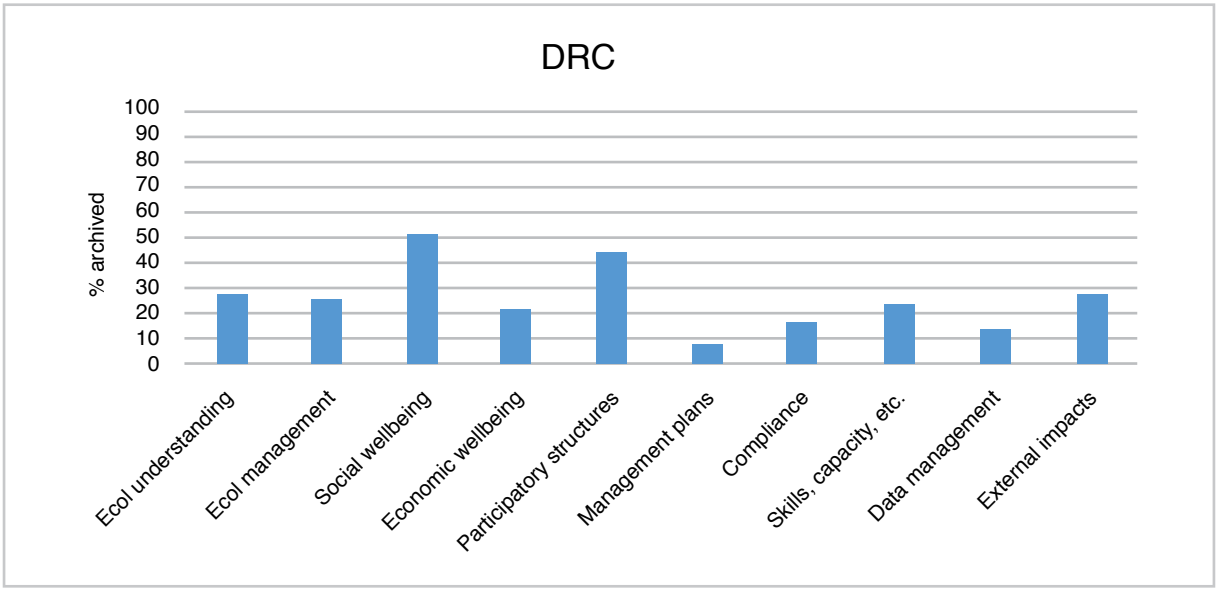

Figure 10: EAF implementation in the small-scale fishery of DRC

The DRC scored the lowest across all objectives with an average of 26 percent. The scores ranged from 8 percent for Objective 6 to 51 percent for Objective 3 (Figure 10). Objective 3, social well-being, was by far the most implemented objective through a poverty alleviation strategy which the government has been implementing for the past ten years. In the last year, the government has been running campaigns in the agricultural sector and these have included fisheries. The implementation of the growth and poverty reduction policy has led to the establishment of structures within government and civil society that deal with issues of poverty alleviation in the fisheries sector. DRC has no management plan in place for the artisanal fishery but is in the process of developing a management plan for the coastal zone in collaboration with Angola, Congo and Gabon. The country does not have the capacity to deal with IUU fishing and does not have the relevant national plan of action, but it is making some effort to improve the capacity of the Department of Fisheries and relevant associations.

Industrial shrimp fishery

The industrial shrimp category is made up of Nigeria, Cameroon, Gabon, Equatorial Guinea and Congo. Nigeria, Cameroon and Gabon have recently been assisted by the EAF-Nansen project to develop a management plan for their fisheries.

Nigeria

The main target species of the Nigeria industrial shrimp fishery are the *penaeid* shrimps (*Farfatepenaeus notialis, Penaeus monodon, Melicertus kerathurus, Parapenaeopsis atlantica* and *Parapenaeus longirostris*). Between 1979 and 1984, the estimated annual potential yield for shrimp was between 3 500 and 4 020 tonnes. However, higher shrimp catches of approximately 5 000 tonnes were recorded between 1992 and 2007. Other important target species are the royal spiny lobster (*Palinurius regius*) and the portunid crabs (*Portunus validus* and *Callinectes spp.*). These species are targeted for the export market. Bycatch species that are retained for their economic value include the fin fishes (bony and cartilagenous), cephalopods (sepia, squids and octopuses) and other invertebrates such as sea cucumbers.

On average, about 83 percent of the registered and operating fishing vessels in Nigeria between 1995 and 2007 were shrimpers. The main fishing method employed in this fishery is trawling and the main gear used is the bottom trawl with an average net length of about 12 m and minimum cod-end stretched mesh sizes of 44 mm, as approved by law. Almost all the vessels operating in Nigeria are rigged with twin-trawl nets and otter doors that allow fishing to take place on both sides of the vessel. All nets are fitted with TEDs which allow for the escape of sea turtles, and BRDs that reduce the capture of juvenile fishes. Shrimp fishing season is mainly between May and September. Available records suggest that in 2010, about 1 600 people were directly employed in the fishery as fishers or sea-going employees, while the number of land-based workers was about 800. Land-based workers include administrative, finance and maintenance personnel.

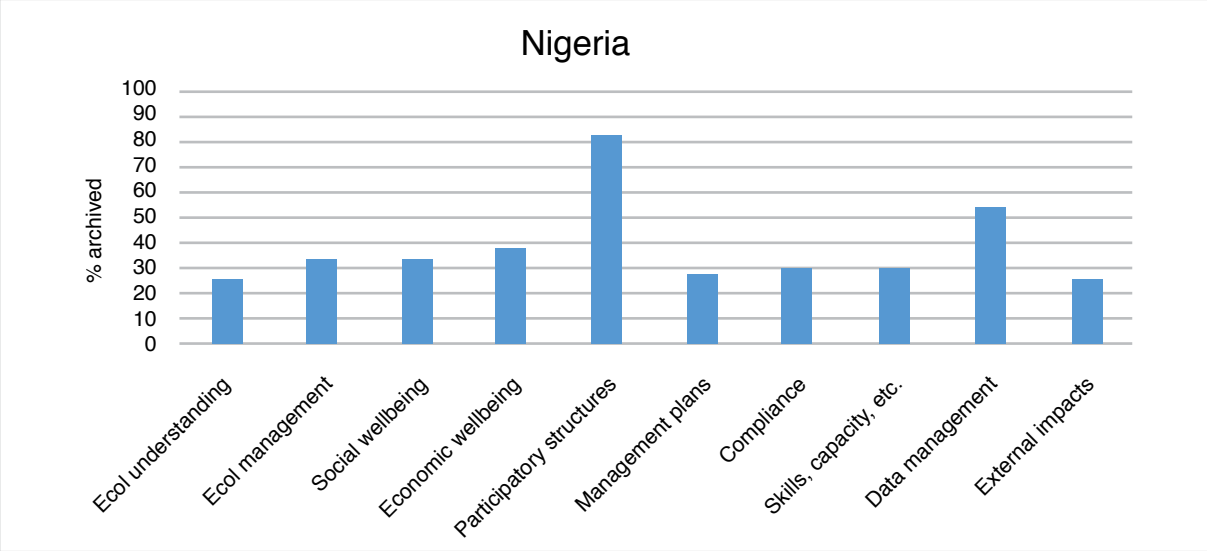

Figure 11: EAF implementation in the industrial shrimp fishery of Nigeria

The overall score for EAF implementation by Nigeria was calculated to be 39 percent. In eight of the ten objectives Nigeria scored between 20 and 40 percent, but scored above 50 percent in Objective 5 (participatory structures) and Objective 9 (data management). (See Figure 11.) Nigeria has good and functioning structures that facilitate consultation with all relevant stakeholders, and good communication channels between government departments. However, there is a need to include EAF considerations on the agenda of the industry associations. In terms of data management, all aspects are in place, including a shore-based observer programme, logbooks, landing declarations and electronic data capturing, but there is a need to improve in all these areas. Currently, there are no sea-based observers. Furthermore, there is speculation as to whether the information captured in the landing declarations is accurate. Currently, logbooks capture bycatch information but there are other components of an EAF that should also be included in the logbooks. Owing to the fact that the Nigerian shrimp fishery exports its products to the European Union (EU), there are standards to adhere to; one of these is the use of TEDs on every vessel. There are also plans to include ghost fishing impacts, plastic pollution and spatial planning in the management of the fishery. The fishery does not directly impact on communities and is therefore not included in the national poverty alleviation plan. A management plan has been drafted through the EAF-Nansen project and is intended to be launched in September 2013, with immediate implementation.

Cameroon

The industrial shrimp fishery of Cameroon mainly targets two species: *Penaeus notialis* and *Parapenaeopsis atlantica*. The trawl net used has a minimum mesh size of 50 mm. Other demersal species constitute the bycatch. Many of the shrimp vessels that operate in Cameroonian waters are Nigerian-registered vessels that operate with licences issued by Cameroonian authorities.

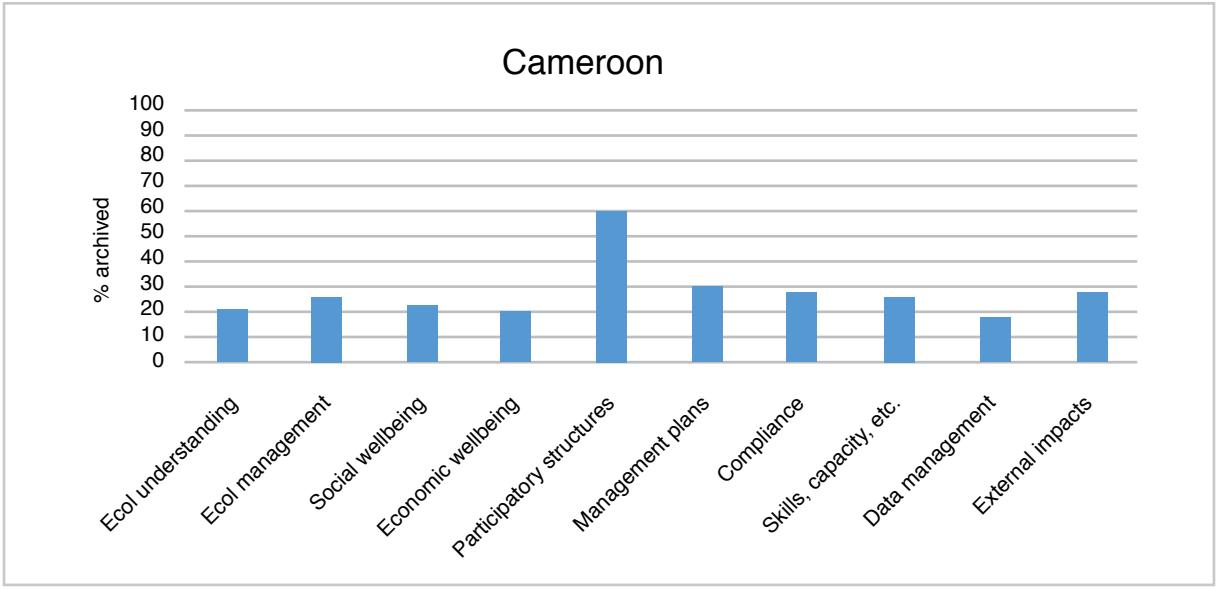

Figure 12: EAF implementation in the industrial shrimp fishery of Cameroon

The implementation scores for Cameroon ranged between 19 and 31 percent, except for Objective 5 which achieved a score of 59 percent (Figure 12). The overall score across all objectives (28 percent) was one of the four lowest in the study. Even though Cameroon's highest score was for Objective 5, there are still some fundamental problems with participatory structures. For instance, the industry associations are not fully inclusive because they do not represent all vessel owners and the National Task Group set up to develop a management plan for the fishery is limited to 12 people and therefore does not adequately represent all stakeholders.

There is also a problem with collecting data for research. Some research is conducted by institutions such as the universities, but there are no links between the fisheries management agency and the universities. There has been experimental work on the use of TEDs by the fishery but the present legal framework does not make provision for their use, although discussions are underway to change the framework

and make the use of TEDs mandatory. There is a draft management plan which is to be presented for approval before the end of 2013. The Ministry of Fisheries has an agreement with the Ministry of Defence to carry out sea patrols and surveillance of fishing vessels. There is inspection and monitoring of fishing vessels and equipment at the quayside, but the compliance personnel are not skilled enough to recognise violations. The judiciary system is not sufficiently conversant with environmental law and therefore not capable of handling environmental transgressions.

Gabon

There are currently three vessels fishing for shrimp in Gabon and a four-month closed season is usually declared to enable the recovery of the stock.

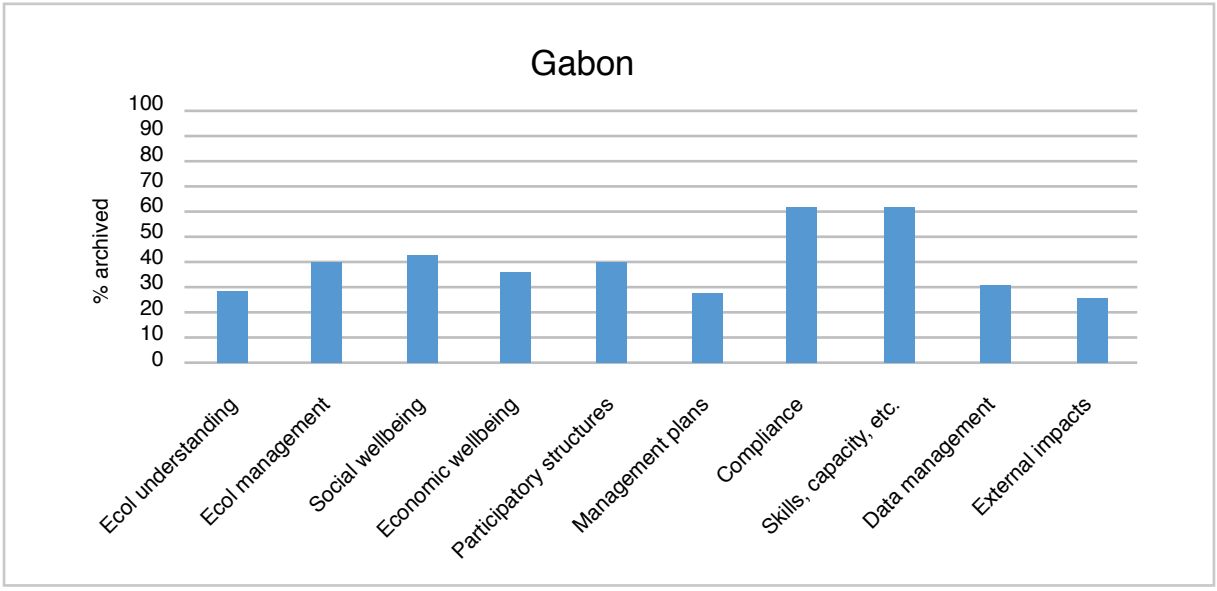

Figure 13: EAF implementation in the industrial shrimp fishery of Gabon

As shown in Figure 13, the range of EAF implementation scores for Gabon was between 26 and 63 percent (across all objectives) with an average of 40 percent. The two objectives with scores considerably higher than the average were Objective 7 (compliance) and Objective 8 (skills, capacity and funding). Gabon is progressing very well in the area of MCS, with a fully functional VMS system that is gradually being improved for use, particularly during the shrimp fishing season when incidents of IUU are highest. Specialised staff training programmes have been put in place and a number of officers have been sent abroad for training. There is a need to source funding from outside Gabon for fisheries management, especially under the EAF framework.

Because there are only three vessels in the shrimp fishery, it is possible to acquire good data on the impact of the fishery. The implementation of the VMS has enabled the Gabon fishery management agency to enforce fishing zones and create areas that are closed to fishing. There is also a ban on fishing within three nautical miles of the coast so as not to impact on the artisanal fishing sector. All shrimp nets are fitted with a TED and no vessel is allowed to fish without one. Gabon has also carried out good sensitization about marine pollution and ship's crews are prohibited from throwing waste overboard. Industrial shrimp fishing is carried out mainly by foreigners and therefore this fishery does not directly impact coastal communities. However, there is a lot of work being done in fishing communities to alleviate poverty through initiatives such as community centres which provide alternative employment for fishers.

Equatorial Guinea

Despite being classified as a shrimp fishery in Equatorial Guinea, the main species caught include Bonito, *Chicharro, Besugo, Calamares, Pulpos,* Dorado, *Merluza, Buro, Saínos, Palometa* and *Machete.* Vessels are licenced through the Ministry of Fisheries but are mainly foreign-flagged.

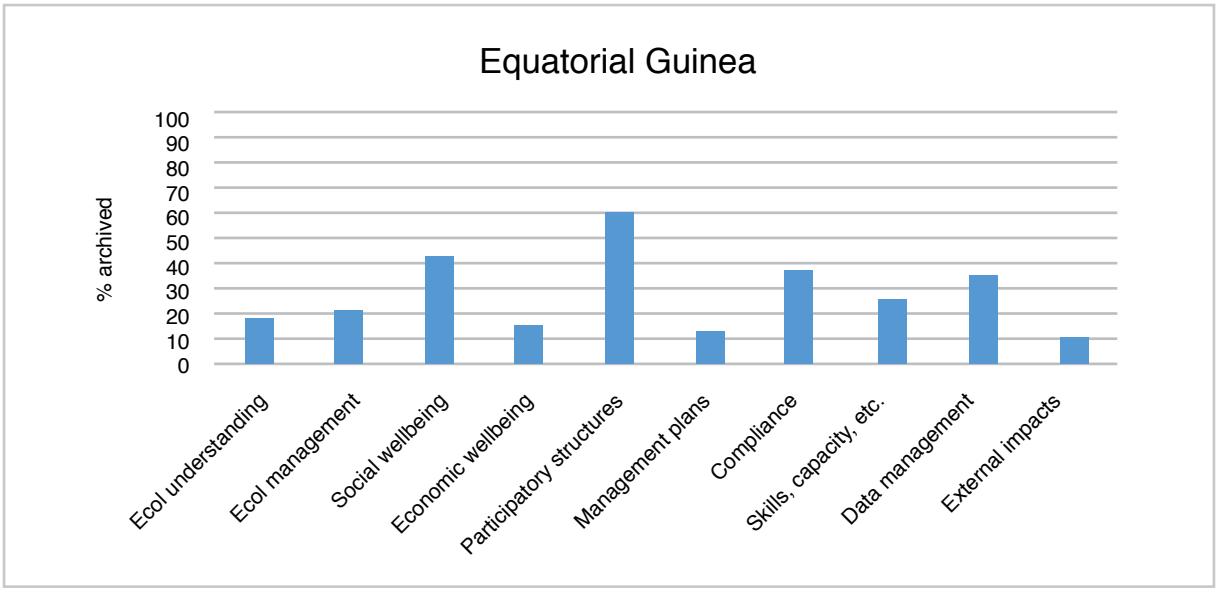

Figure 14: EAF implementation in the industrial shrimp fishery of Equatorial Guinea

The overall EAF implementation in Equatorial Guinea was 28 percent, with scores ranging from 11 percent for Objective 10, to 60 percent for Objective 5 (Figure 14). Equatorial Guinea has participatory structures in place and regional and subregional cooperation is good (Objective 5). There is no official research programme, but several research needs have been identified. Currently, there is no management plan for the fishery, but there are policies and plans in place for poverty alleviation in fisheries. The vessels are mainly foreign-owned. In terms of law enforcement, the country's Navy does conduct sea patrols.

Congo

The industrial shrimp fishery in Congo targets mainly *Parapenaeus longisrostris* (deep-water shrimp) and *Penaeus notialis* (coastal shrimp). The fishery uses bottom trawl gear and in 2010 the total production was 973 tonnes of deep-water shrimp and 1 179 tonnes of coastal shrimp. Access to the resource is limited by permits.

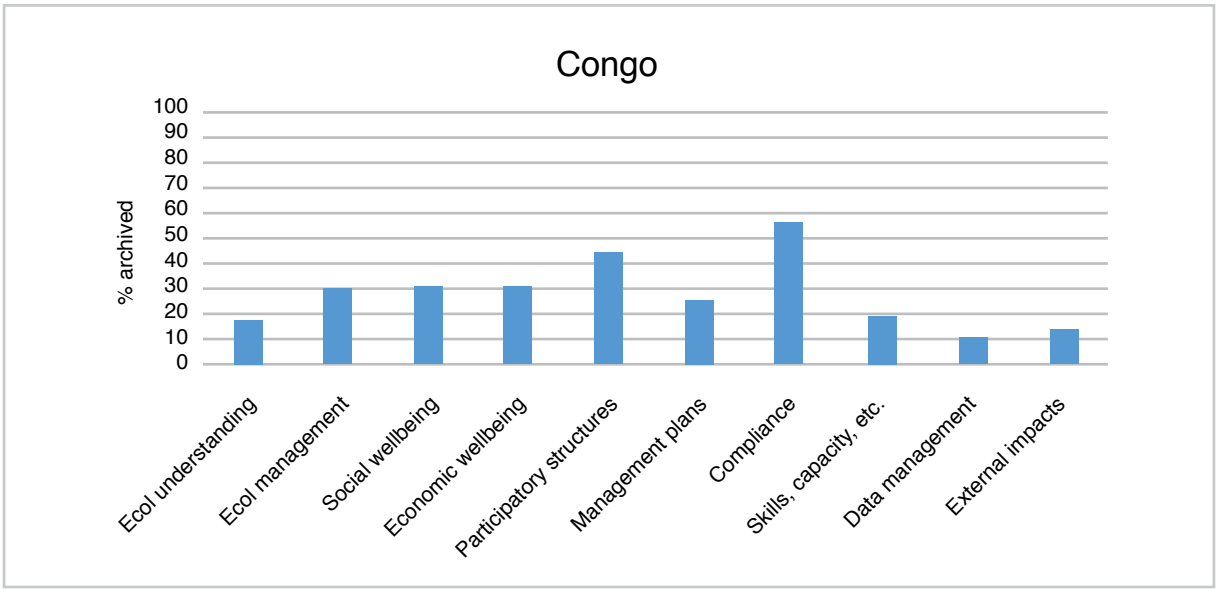

Figure 15: EAF implementation in the industrial shrimp fishery of Congo

Implementation of EAF in the industrial shrimp fishery of Congo averaged 28 percent, with individual objective scores ranging from 12 to 57 percent (Figure 15). Congo does not have a research institute, capacity or funding to carry out research. Chinese vessels fish in Congolese waters and although the vessels do not target shrimps, shrimps are often caught as bycatch, a situation that is of great concern because it is not known what impact this has on the shrimp resources. A closed season has been instituted, but this is not enforced. The fishery does provide employment for Congolese fishers. There is no management plan in place for the industrial shrimp fishery. Recently, the quantities of sharks observed in offloaded catches have prompted the Ministry of Fisheries and Aquaculture to consider drafting of a NPOA for sharks. Sea patrols are carried out but these are irregular. There is no budget for research in the Ministry and even the activities that have been approved by the Ministry are insufficiently funded and are not carried out. People with the relevant skills are available, but they are too few in number to adequately manage the work. There is a training programme available, but this has never been implemented.

Beach seine

The Beach seine category includes Ghana, Togo and Benin. Together with Côte d'Ivoire and with the support of the EAF-Nansen project, the three countries have collaborated to prepare a management plan for their beach seine fisheries. At the time of the workshop, the plans were yet to be approved for implementation.

Ghana

A survey conducted in 2004 found that there were 903 canoes and 124 219 fishers active in the marine beach seine fishery in Ghana. The size of canoes ranges from 8.4 m to 13.4 m and most are not motorized. The beach seine fishery exploits a wide range of species, from surface dwelling small pelagic to demersal species. A typical beach seine landing would include species such as sardinellas, anchovy, threadfins, scad mackerel, grey mullets, jack mackerels, shrimps, Caranx, surgeon fish and others. The total beach seine catch in 2004 was 100 000 tonnes. All indicators point to a downward trend in catches over the past few years.

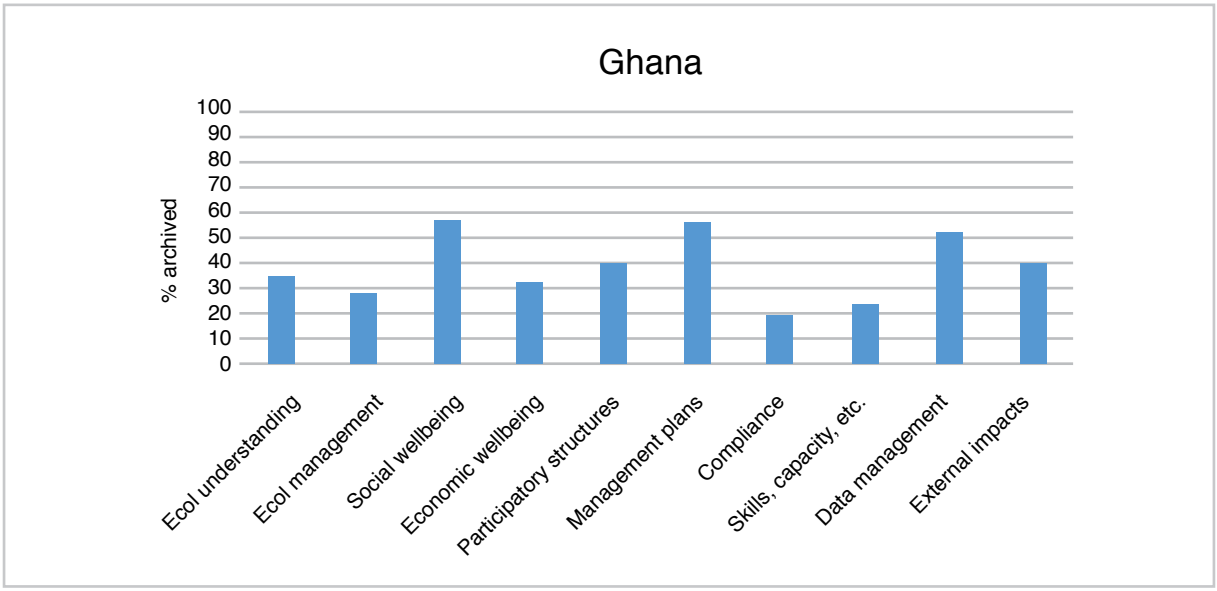

Figure 16: EAF implementation in the beach seine fishery in Ghana

The overall EAF implementation score in the Ghanaian beach seine fishery was 39 percent, with scores for individual objectives ranging from 20 percent (Objective 7: compliance) to 59 percent (Objective 3: social well-being of fishers). There is a good understanding of the role the fishing industry plays in poverty alleviation in Ghana (Objective 3) (Figure 16). The majority of fishers in Ghana's beach seine

fishery fall into the country's lower income bracket. In many cases, fishers have dropped out of school to start fishing and earn money. There is a serious lack of skills in this fishery, both among the fishers and in the managing authority (management, compliance and research). There is no functioning MCS in Ghana and beach patrolling does not take place. Moreover, the specialized unit does not function and the court system does not prioritize this fishery, but concentrates on the industrial fishery. There are no NPOAs in place. At present, the gear used in the beach seine fishery catches juvenile fish and there is work underway to adapt the gear to reduce the catch of juveniles.

Togo

Togo has a very short coastline and a narrow continental shelf and consequently, marine fisheries have very little potential to be of significant value. In the past fisheries were not a priority in the country, but since 2009 fisheries management has been accommodated in the country's budget and there has been more focus on the fishing industry. The beach seine fishery in Togo mainly targets demersal and pelagic species namely, *Sardinella aurita, Sardinella maderensis, Engraulis encrasicolus, Ilisha africana, Caranx spp., Trachurus spp., Selene dorsalis, Chloroscombrus chrysurus, Pseudotolithus spp., Galeoides decatactylus, Brachydeuterus auritus, Sphyraena spp.* and *Trichiurus lepturus*. The beach seine fishery operates throughout the year. In 2011, the number of participants in the beach seine fishery was 2 048. Eighty-eight percent of participants were Togolese.

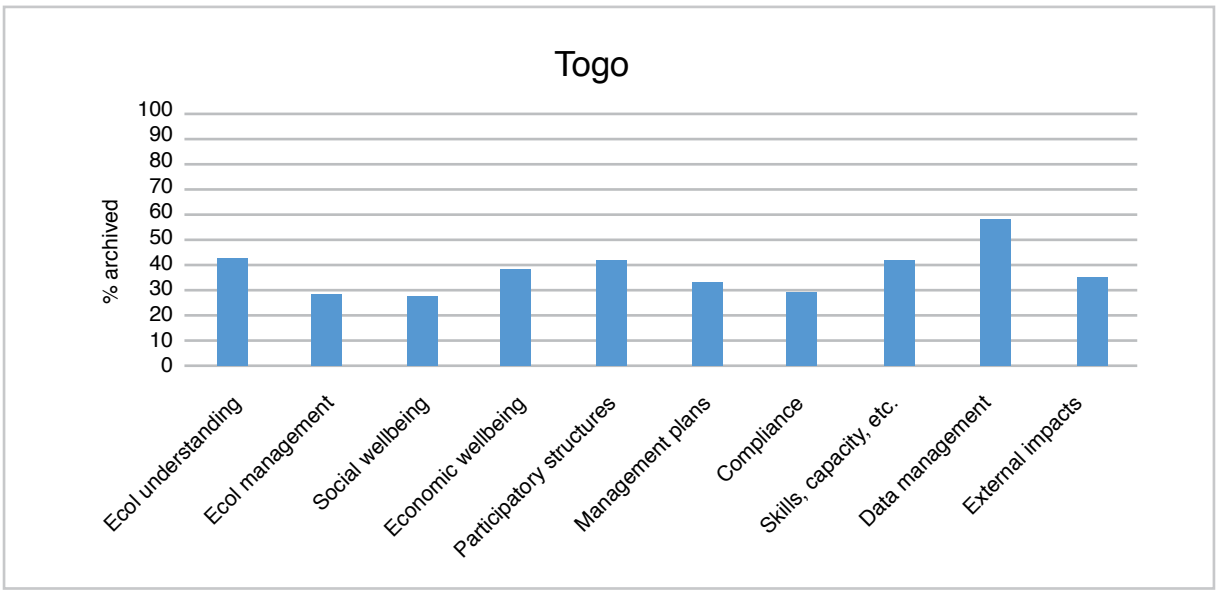

Figure 17: EAF implementation in the small-scale fishery of Togo

The level of EAF implementation in Togo varied from 28 to 60 percent with an average score of 38 percent across all objectives (Figure 17). Togo has a participatory management framework in place but there is lack of collaboration between managers and stakeholders. Currently, there is no research programme in place to understand the biology of the species caught in the beach seine fishery or the impact of the fishery. A draft management plan has been prepared for the beach seine fishery and it includes some EAF considerations, such as protection of endangered species, prevention of pollution and application of spatial planning in the form of MPAs. However, the plan does not consider the biomass of the fish populations or the impact the fishery has on predators. It is envisaged that this plan will be approved for implementation by the end of 2013. The management plan takes into consideration poverty alleviation and alternative income generating activities. Many of the beach seine fishers live above the poverty line but lack the skills required to manage their incomes and, as a result, they are considered among the poor in society. A national policy document addresses the issue of poverty alleviation across the entire country, but it is not sector specific and there is no process to measure progress against the policy. Some companies smoke fish and export their products to the European Union, but this activity does not benefit all fishers.

Benin

Figure 18 shows the percentage scores of all ten objectives related to the implementation of the ecosystem approach to fisheries. The highest score of 57 percent is for Objective 2 (ecosystem impacts), the lowest score of 29 percent is for Objective 10 (data management) and the overall score for EAF implementation is 41 percent. The net used in the Benin beach seine fishery ranges between 800 and 2 000 m in length and is pulled onto the beach by 20 to 60 people. A typical catch consists of all species found in the area and the main species caught are: *Ilisha africana, Ethmalosa fimbriata, Selene dorsalis, Engraulis encrasicolus* and *Trichiurus lepturus*. The catch is composed of 60 to 80 percent juveniles and accounts for 50 to 75 percent of the total catch of the artisanal fishery sector which is close to 30 000 tonnes on average (1995–2000) as reported by Gbaguidi (2001). There are 118 active units in the fishery, each comprising about 13 fishers. Actors in the fishery include fishers, agro-fishers, occasional fishers, traders, net repairers, post-harvest processors, mechanics, carpenters, beach workers who carry the fish, and members of the beach management team. Beach seine units are predominantly made up of Beninois people (75 percent) with Ghanaians and Togolese making up the remaining 25 percent.

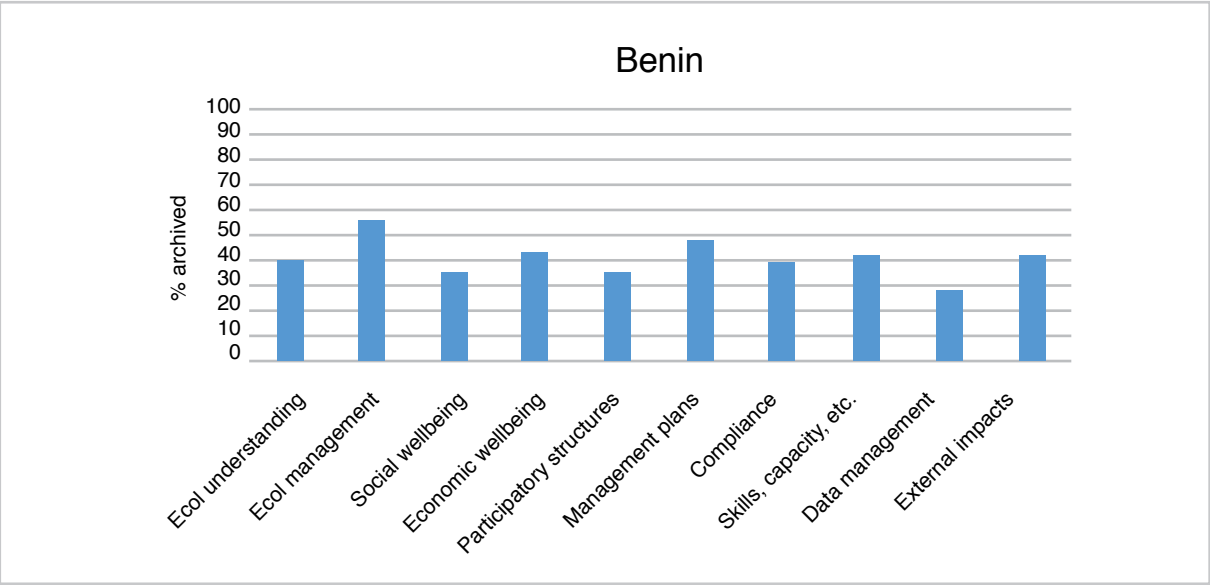

Figure 18: EAF implementation in the small-scale fishery of Benin

Benin's oceanographic institute was established in 2012 to undertake fishery research but it currently has insufficient funding to conduct the necessary research. Certain NGOs are carrying out research on turtles and whales but these species are not directly impacted by the beach seine fishery. In terms of implementing EAF management, Benin has three MPAs which have been defined and are soon to be passed into law. There is collaboration with the environment ministry to ensure that the MPAs are management appropriately. A beach seine management plan has been adopted, but there is a need for funding so that it may be implemented effectively. The management plan takes into account the economic viability of the fishery and, if properly implemented, its intention is to improve the livelihood of the actors. There is political will to develop fisheries in Benin and there is a national development plan which takes poverty alleviation into account, but does not give specific tasks related to fisheries. There is a need to update the laws in terms of fisheries compliance because there are no patrols at present and the industrial fisheries are intruding into the artisanal fishing zones.

COMPARISON WITH OTHER REGIONS IN AFRICA

The results of this study were compared with those obtained from a similar analysis conducted in the BCC region (Angola, Namibia and South Africa), where several ecological risk assessments have been undertaken in the past eight years, and the South West Indian Ocean Fisheries Commission (SWIOFC) area (eastern Africa and adjacent island States) where a similar workshop was held in 2011 (Figure 19).

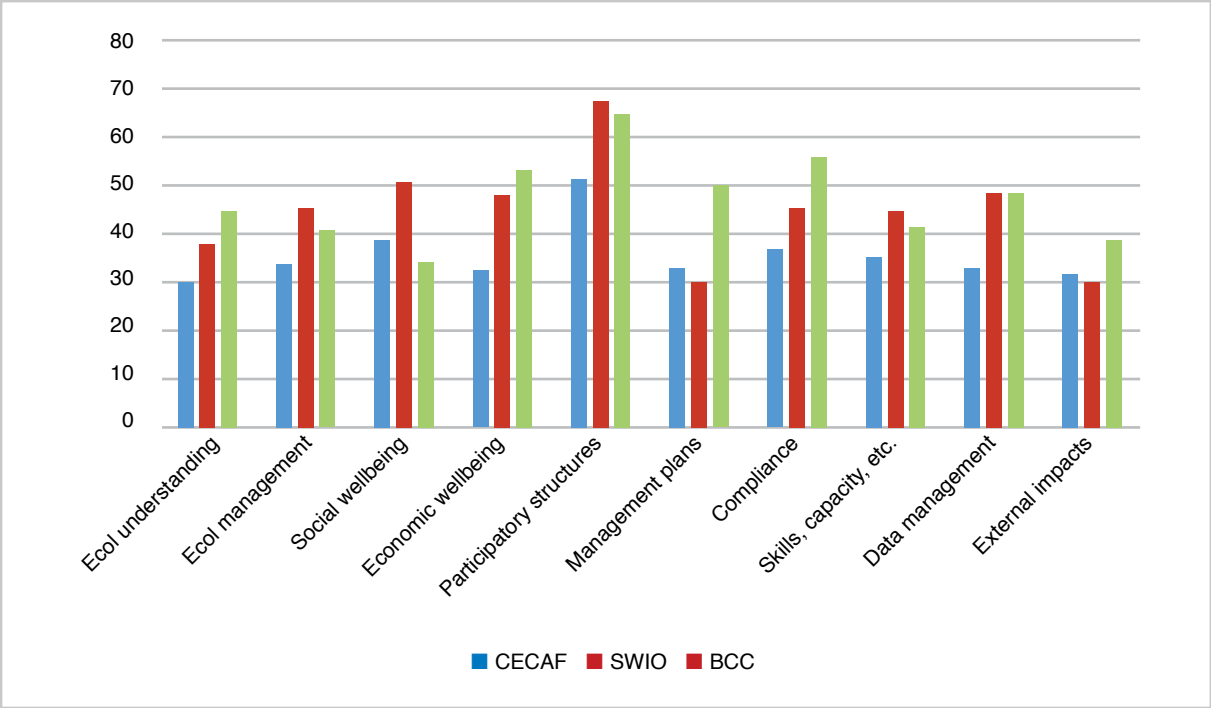

Figure 19: Comparison of results of implementation between CECAF south, SWIO and BCC areas

Objective by objective comparisons show that EAF implementation in the three areas (CECAF south, SWIO and BCC) are quite similar, but marked differences are observed in Objective 3 (social well-being of dependent fishing communities), Objective 4 (economic well-being of the fishery), Objective 6 (management plans incorporate EAF considerations) and Objective 9 (data management). The results show that, in general, the CECAF area currently lags behind the other two areas in the implementation of the ecosystem approach to fisheries (Figure 20).

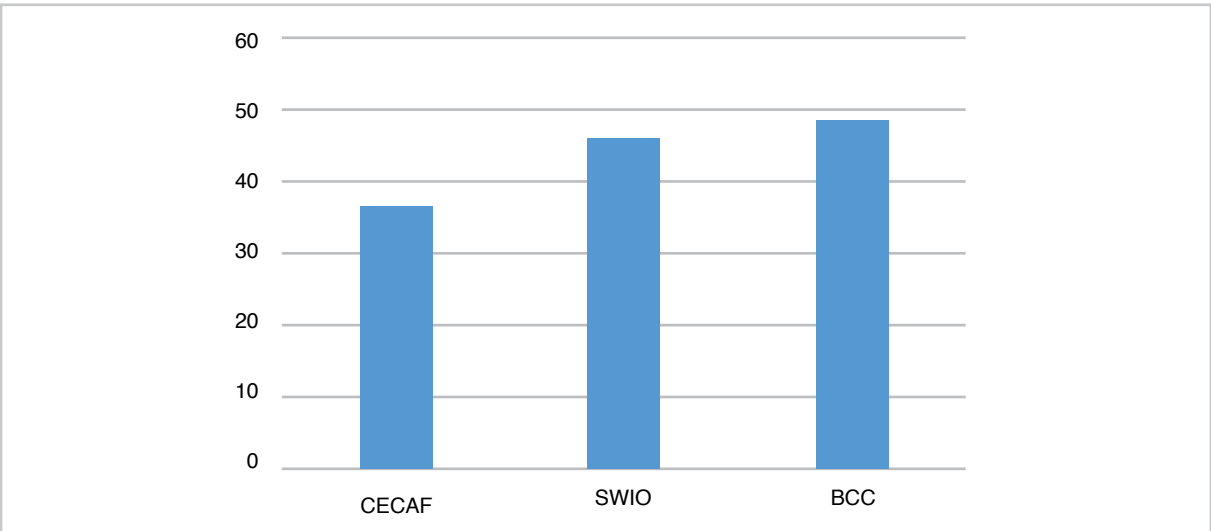

Figure 20: Comparison of overall results of implementation between CECAF south, SWIO and BCC areas

LIMITATIONS OF THE STUDY

The results are largely influenced by the knowledge, perception and assessment of the participants. In a regional workshop covering selected fisheries from 13 countries, it was not possible to include all the relevant national stakeholders in the discussions and deliberations. Some country delegations had broader and more dynamic stakeholder representation than others. As a result of these limitations there is a need for caution in interpreting the results, especially comparisons between the countries.

CONCLUSIONS AND RECOMMENDATIONS

The EAF Tracking tool has provided a platform for fisheries managers, researchers and other stakeholders to grapple with the complexity of implementing an EAF. It has allowed for stakeholder interactions and understanding of EAF issues and the sharing of information among multiple stakeholder groups. In general, the results of the analyses show that the countries are working towards honouring the commitment made at the WSSD to further the implementation of an ecosystem approach to fisheries. This notwithstanding, many of the countries are not aware of this effort and are either sceptical about EAF implementation or believe they do not have the capacity to implement EAF.

To make further progress in EAF implementation, the following were identified as the key issues to be addressed in the region:

1. Funding needs
2. Capacity building
3. Research and data collection
4. Observer training
5. MCS
6. Policy reform to support an EAF
7. Rights-based management consideration
8. Conflict with the growing oil and gas industry
9. Alternative sustainable livelihoods

Overall, this process has provided a good first step in stimulating the implementation of an EAF in the CECAF South region and it provides the baseline to track further implementation. It has also stimulated discussions on the implementation of an EAF in the region. Its real value will be in reviewing the same fisheries over time to track progress. The limited representation at the workshop across stakeholder groups limits the credibility of the outputs. In the region, further workshops with broader stakeholder participation (including fishing industry and NGO representatives), preferably at country level, are required to improve upon the outcomes.

It is important to note that EAF implementation is a process that begins with planning and proceeds through implementation and monitoring. Each phase is important. However, it is also important to note that countries are not starting from scratch with EAF implementation and knowledge about the system differs from case-to-case and between countries. The workshop has highlighted areas that require additional work before ecosystem considerations may be fully included in the management of fisheries and governments should be encouraged to do more for EAF implementation.

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APPENDIX 2
QUESTIONNAIRES

Country..... Date.....

Name(s) of Individual(s) completing the questionnaire .....

.....

.....

Designation.....

Management authority/Research agency and contact details .....

Name/Description of Fishery.....

.....

.....

Introduction

This exercise is to help assess the level of implementation of the ecosystem approach to fisheries (EAF) in countries in the Southern sector of the Fisheries Committee for the Eastern Central Atlantic (CECAF) region. One of the World Summit on Sustainable Development (WSSD) plan of implementation targets is for countries to adopt the ecosystem approach to fisheries (EAF) in the management of their fisheries by the year 2010. The implementation involves a process of putting in place necessary mechanisms that support EAF.

FAO and partners have used Ecological Risk Assessments as a tool to provide a structured, transparent process to develop a shared vision amongst stakeholders and clarifies what is required to implement an EAF in a particular fishery. Generic Component Trees are used in the identification of issues in a structured way to ensure that all the key components of a fishery system are assessed. Once the risks and priorities for a fishery have been identified through the ERA process, it is necessary to check regularly whether progress is being made in addressing these priorities. An EAF tracking tool has also been developed to track selected operational objectives for management. Usually, the tool is used at a workshop with all the key stakeholders to make sure that different societal objectives or aspirations are reflected in identifying the key priorities.

This approach will be used to establish a baseline for EAF implementation in each of the CECAF-South countries, and in the region as a whole, by working on selected fisheries that are important both nationally and regionally. This questionnaire is to gather background information for the exercise. It may be used for a single species fishery (e.g. industrial shrimp fishery) or a collection of multi-species, multi-gear fisheries (e.g. the artisanal fisheries sector). The questions are based on the ten operational objectives for EAF implementation formulated to follow the generic component trees (Appendix 2).

In the tables "*" refers to the table (in Appendix 1) used to identify the appropriate process step, and "**" should enable the respondent (and participants) to decide on the process step the fishery is currently at (and the management intervention) using the appropriate table. These should guide your decision on level of management and the answers will be discussed at a workshop to be held in Accra, Ghana on 15–18 July 2013.

Objective 1: The managing authority has a good understanding of the ecosystem impacts of fisheries including target, non-target and general ecosystem	Table*	Step**	Description of step, comments (including details of progress, barriers etc.) and actions to be undertaken (including details of research or management required to fulfill objective)
Target species or valuable retained bycatch (Objective: Research and management should aim to ensure sustainable utilization = Type A species)			
1.1 Is there a good understanding of life history parameters that enable adequate stock assessment (e.g. natural mortality, age length key, age at maturity, factors affecting recruitment)?	1		
1.2 Is there a good understanding of the fisheries dependent parameters that enable adequate stock assessment (e.g. fishing mortality, fishing effort)?	1		
1.3 All fishing mortality including bycatch, poaching and discarding is adequately understood.	1		
1.4 The spatial distribution (including trans-boundary distribution) is adequately understood.	1		
1.5 The stock identity and/or genetics is well understood.	1		
Bycatch species that are threatened e.g. seabirds, vulnerable to overexploitation or the target of another fishery (Objective: to minimize bycatch = Type B species)			
1.6 The impacts of the fishery on bycatch or vulnerable species have been quantified.	1		
Other bycatch species that, based on existing understanding, are unlikely to be vulnerable to the current level of exploitation (Objective: keep a watching brief = Type C species)			
1.7 Monitor relevant catch and survey data.	1		
General Ecosystem considerations			
1.8 Fishing impacts on marine habitats and ecologically important areas e.g. spawning areas, nursery areas, predator foraging areas, have been assessed and quantified.	1		
1.9 There is good understanding of the trophic role, diets and foraging behaviour of predators that are dependent on the species under assessment.	1		
1.10 There is good understanding of the diet and role of species under assessment as secondary consumers in the trophic web.	1		
1.11 There is good understanding of the ecosystem impacts of supplementary feeding (by making offal and/or catches available to predators).	1		
1.12 There is good understanding of the ecosystem impacts of de-predation by top predators including its impact on the economic viability of the fishery.	1		

1.13 There is good understanding of gear loss and/or ghost fishing including entanglement.	1		
1.14 Disease-related risks (e.g. from imported fish products like bait) are well understood.	1		

Objective 2: Ecosystem impacts of fisheries are included in management	Table	Step	Description of step, comments (including details of progress, barriers etc.) and actions to be undertaken (including details of research or management required to fulfill objective)
Target species or valuable retained bycatch (Objective: Research and management should aim to ensure sustainable utilisation = Type A species)			
2.1 Target species or valuable retained bycatch are managed at optimal sustainable utilisation (including the incorporation of life history parameters, fishing mortality (including poaching and bycatch), recruitment and ecosystem impacts into management).	2		
2.2 Appropriate management is in place to effectively manage bycatch species which is either threatened, vulnerable to over exploitation or the target of another fishery.	3		
2.3 Appropriate management is in place to effectively manage other bycatch species that, based on existing understanding, are unlikely to be vulnerable to overexploitation or targeted by other fisheries.	3		
2.4 The appropriate spatial management is in place.	2		
General Ecosystem considerations			
2.5 Appropriate management actions, e.g. gear restrictions, closed areas/seasons etc., have been identified and tested and are supported by stakeholders to address fishing impacts on marine habitats and ecologically important areas.	2		
2.6 The necessary biomass to sustain healthy populations of these predators (by volume and spatially) has been quantified and these needs are formally included into management procedures.	2		
2.7 The biomass needed to ensure stability in the ecosystem has been quantified and the ecosystem impacts of fishing on secondary consumers has been formally included in management procedures.	2		
2.8 Fisheries operations have been amended to mitigate the impacts of diet supplementation on, or depredation by top predators.	2		

2.9 Fisheries operations have been amended to mitigate the impacts of depredation.	2		
2.10 The impact of gear loss and/or ghost fishing including entanglement are included in management procedures.	2		
2.11 Disease related risks (e.g. from imported fish products like bait) are addressed by management.	2		
2.12 Discarding of pollutants (e.g. plastics) is included in management procedures.	2		

Objective 3: The Social well-being of dependent fishing communities is accounted for in management.	Table	Step	Description of step, comments (including details of progress, barriers etc.) and actions to be undertaken (including details of research or management required to fulfill objective)
3.1 The government, as custodian of a common resource (that policy requires to be utilized for the benefit of all in the country), has a good understanding of the role of the fishing sector in addressing poverty alleviation (e.g. food security, employment, health, education).	1		
3.2 Issues of poverty alleviation (e.g. food security, primary health care and basic education) are included in management plans and policies and appropriate management actions are taken.	12		
3.3 Social implications related to the fishery are included in Integrated/Local Development Plans.	13		
3.4 The government agency has sufficient capacity to address gazetted social priorities (e.g. poverty alleviation, job creation, food security, primary education, health care).	6		
3.5 Transdisciplinary collaborations on issues of poverty alleviation, basic education and primary health care between the fisheries management agency and other line ministries (e.g. Ministry of Education, Health etc.) & NGOs are established.	14		

Objective 4: The economic well-being of the fishing industry is incorporated into management.	Table	Step	Description of step, comments (including details of progress, barriers etc.) and actions to be undertaken (including details of research or management required to fulfill objective)
4.1 Individual rights are economically viable.	15		
4.2 An appropriate and fair rights allocation process is in place.	16		

4.3 Management of the fishery is aimed at long-term financial stability and job security for all those involved in the fishery, not only rights holders.	15		
4.4 All rights holders have adequate business skills and marketing skills.	7		
4.5 All stakeholders possess adequate skills to participate in co-management.	7		
4.6 Effective training mechanisms are in place to provide EAF skills development to relevant members of the industry (e.g. responsible fisheries training courses, safety at sea).	7		
4.7 The fishery is eco-labeled.	17		
4.8 Processes are in place to ensure the traceability of products as desired by the export market (e.g. EU requirements).	30		
4.9 The industry has a strategy to ensure long-term market security (e.g. diversity of markets/products, product branding).	18		
4.10 There is a clear understanding of the economic context of the fishery.	1		
4.11 Economic implications of management decisions are clearly integrated into fisheries management advice and procedures.	19		

Objective 5: The managing authority has transparent and participatory management structures that ensures good communication and information sharing locally and regionally	Table	Step	Description of step, comments (including details of progress, barriers etc.) and actions to be undertaken (including details of research or management required to fulfill objective)
5.1 Effective and cohesive industry associations are in place and functioning.	20		
5.2 Effective participatory management fora (e.g. Working Groups) are functioning.	20		
5.3 Working groups have good stakeholder participation (e.g. fishing industry, NGO etc.).	21		
5.4 Channels or forums are in place for communication with other government agencies (e.g. oil and minerals, transport, safety at sea, health standards, and customs).	14		
5.5 Channels or forums are in place to facilitate communication among senior managers of the different fisheries departments (i.e. compliance, research and resource management).	14		

5.6 Channels or forums are in place to facilitate communication among operational managers of the different fisheries departments (i.e. compliance, research and resource management).	14		
5.7 Regional co-operation is operational and institutionalized (e.g. CECAF).			
GCLME	28		
5.8 Your country is an active member of relevant RFMO.			
CECAF	29		
ICCAT	29		

Objective 6: Management plans incorporate EAF considerations	Table	Step	Description of step, comments (including details of progress, barriers etc.) and actions to be undertaken (including details of research or management required to fulfill objective)
6.1 Sector management plans which incorporate EAF considerations for all three dimensions of EAF are in place and peer reviewed.	23		
6.2 All relevant National Plans of Actions have been developed and implemented.			
Seabirds NPOA	24		
Shark NPOA	24		
IUU NPOA	24		
Capacity NPOA	24		

Objective 7: Good compliance to regulations reduces ecosystem impacts of fisheries	Table	Step	Description of step, comments (including details of progress, barriers etc.) and actions to be undertaken (including details of research or management required to fulfill objective)
7.1 Appropriate regulatory mechanisms exist and adequate follow-through provide effective disincentive for non-compliance.	25		
7.2 Adequate mechanisms are in place to support voluntary compliance (e.g. performance review procedures, eco-labelling, etc.).	26		
7.3 All aspects of MCS are functioning well and are leading to good compliance:			
a. Regular at sea patrols are undertaken	27		
b. Adequate shore based controls are in place (e.g. in harbours, at landing sites etc.)	27		
c. The specialised unit (SU) functions well	27		
d. Functional VMS system implemented	27		

e. Legal/Court system adequately apprehends offenders	27		
f. Regular aerial patrols are undertaken.	27		

Objective 8: Sufficient capacity, skills, equipment and funding exist to support the implementation of an EAF	Table	Step	Description of step, comments (including details of progress, barriers etc.) and actions to be undertaken (including details of research or management required to fulfill objective)
8.1 Good research capacity is available to adequately understand EAF in this sector.	6		
8.2 The skills development mechanisms (e.g. training courses etc.) are adequate to allow EAF related research.	7		
8.3 The funding to facilitate adequate capacity, equipment and skills for research are understood and met.	8		
8.4 The fisheries agency has adequate capacity to advise fisheries management decisions.	6		
8.5 The fisheries agency has the necessary skills to implement EAF management i.e. adopting research advice into regulations (e.g. closed area/season, quota, gear restriction)	7		
8.6 The fisheries agency has funding to facilitate adequate capacity, equipment and skills for implementing management decisions.	8		
8.7 There is adequate capacity to address compliance issues.	6		
8.8 The compliance section has the necessary skills to implement an EAF (including a good understanding of the regulations, the appropriate penalties and evidence collection).	7		
8.9 There is adequate funding to facilitate capacity, equipment and skills for compliance.	8		
8.10 Employment equity within the fisheries agency according to transformation goals has been achieved.	22		

Objective 9: Good data procedures exist to support EAF implementation	Table	Step	Description of step, comments (including details of progress, barriers etc.) and actions to be undertaken (including details of research or management required to fulfill objective)
9.1 Both land-based and at sea observer programme is operational and provides accurate information to inform the management of the sector.	9		

9.2 Accurate logbook information informs research and management of the sector.	10		
9.3 Accurate Landing declaration information informs the management of the sector.	10		
9.4 Appropriate electronic data management systems are in place (research and catch data).	11		
9.5 Data management systems for socio-economic data are in place and are being used.	11		
9.6 Electronic data management systems (operational data) are in place.	11		

Objective 10: External impacts of the fishery are addressed (e.g. the effect of other sectors, other industries, climate change, etc.)	Table	Step	Description of step, comments (including details of progress, barriers etc.) and actions to be undertaken (including details of research or management required to fulfill objective)
10.1 There is good understanding of the effect of other fisheries on this fishery and vice versa.	1		
10.2 There is a good understanding of the effect of external ecological changes and climate change on this fishery.	1		
10.3 There is a good understanding of the effect of other industries (e.g. mining) on this fishery.	1		
10.4 There is a good understanding of economic drivers (e.g. oil price, exchange rates etc.) on this fishery.	1		
10.5 There is a good understanding of the effect of social factors (e.g. HIV/Aids) on this fishery.	1		

APPENDIX 2.1 PROCESS STEP TABLES FOR ASSESSMENT

TABLE 1	Research/good understanding
1	No research programme initiated or needs identified
2	Research needs/issues have been identified and prioritized
3	Research programme to address needs is underway
4	Preliminary data available but not yet analysed
5	Research adequately addresses priority needs
6	Research is producing comprehensive results beyond priority needs
7	Research is producing comprehensive results beyond priority needs and are regularly published in peer reviewed reports/ papers

TABLE 2	Management – general
1	No management actions implemented or strategy developed whatsoever
2	Intention to develop a strategy to incorporate parameters into stock assessment models
3	Responsibility assigned (e.g. relevant researcher, task group constituted, or Resource management working group etc.)
4	Activities towards implementation (e.g. identification of appropriate management actions)
5	Some relevant parameters are addressed by management measures (e.g. stock assessment, permit conditions, etc)
6	All relevant parameters are addressed by management measures
7	All relevant parameters are addressed by management measures and good implementation occurs on the ground

TABLE 3	Management/mitigation – bycatch
1	No consideration of management actions
2	Identification of possible mitigation measures/actions
3	Preliminary testing appropriate mitigation measures/actions
4	Stakeholder support and input
5	Refined testing and/or investigation with stakeholder support
6	Incomplete suite of measures implemented and supported by stakeholders
7	Practical, appropriate mitigation measures that consider the entire eco-system are implemented and supported by stakeholders

TABLE 4	Regulation – bycatch
1	No regulation whatsoever
2	Intention to develop regulation
3	Responsibility assigned (e.g. relevant researcher, task group constituted, or working group etc.)
4	Activities towards implementation (e.g. identification of appropriate management actions)
5	Partial implementation
6	Adequately included into permit/ license conditions
7	There is good compliance

TABLE 5	Monitoring of non-vulnerable species
1	No monitoring programme initiated
2	Intention to develop monitoring programme
3	Monitoring programme has been designed, data needs have been identified and prioritized
4	Monitoring programme producing preliminary data, but no analysis
5	Monitoring programme addresses basic needs and is producing preliminary results
6	Monitoring programme produces comprehensive results and thresholds to indicate the need for management are identified
7	Comprehensive understanding based on reliable, long-term data series and management decision made based on indicator levels

TABLE 6	Capacity
1	Capacity needs not understood
2	Adequate understanding of the capacity needs
3	Number of positions reflects capacity needs
4	60% of required positions filled
5	75% of required positions filled
6	85% of required positions filled
7	100% of required positions filled

TABLE 7	Skills
1	No understanding of skill needs
2	adequate understanding of skill needs
3	Mechanisms/opportunities for skills development in place and/or specific courses being developed
4	Less than 50% of staff/industry are at required levels
5	60% of staff/industry are at required levels
6	80% of staff are at required levels
7	All staff are at required levels

TABLE 8	Funding
1	No understanding of funding needs
2	Adequate understanding of funding needs
3	Less than 50% of required funding obtained
4	50% of required funding obtained
5	65% of required funding obtained
6	80% of required funding obtained
7	All required funding obtained

TABLE 9	Observers
1	Observer programme only addresses single species needs
2	Good data sheets designed to adequately capture all the relevant information (e.g. target and non-target species)
3	Training programme implemented to ensure that observers are adequately skilled in data collection
4	Observer coverage is adequate to ensure that data is representative
5	Data collected that is representative and useful to inform research and management
6	Reliable data management procedures in place to ensure that data is up to date and verified
7	Observer data is being routinely used and communicated to stakeholders

TABLE 10	Logbooks/landing declaration
1	Logbook/landing declaration design only captures target species information
2	Good data sheets designed to adequately capture all the relevant information (e.g. target and non-target species) for an EAF
3	Training programme implemented to ensure that skippers are adequately skilled in data collection
4	Data collected that is representative and useful to inform research and management
5	Functional system to get logbooks from vessels to the relevant agency/department in efficient and timely manner
6	Reliable data management procedures in place to ensure that data is up to date and verified
7	Logbook data is being routinely used and results are communicated to stakeholders

TABLE 11	Electronic data management
1	No electronic data management system in place
2	Intention to develop electronic data management system
3	Current data management system only incorporates single species data or development is incomplete
4	Reliable and comprehensive data management procedures in place which incorporates all aspects of an EAF and clear terms of reference for database manager in place
5	Database is regularly updated OR Mechanisms are in place for verification (Score if either is true)
6	Database is regularly updated AND mechanisms are in place to ensure adequate independent verification
7	There is timely feedback of analysed data to stakeholders

TABLE 12	Human well-being – management
1	No strategy for action whatsoever
2	Intention to develop a strategy
3	Structures in place to ensure trans-disciplinary collaboration and stakeholder co-operation (e.g. trans-disciplinary working group or task group)
4	Activities towards implementation (e.g. identification of appropriate management actions) but no mechanism for evaluation in place
5	Mechanism for strategy evaluation in place
6	Ongoing evaluation of strategy is taking place and the strategy is adjusted accordingly
7	Strategy is amended and implemented successfully

TABLE 13	Human well-being – development plans
1	No understanding of the role this fishery plays in the local economy
2	Good understanding of the role this fishery plays in the local economy
3	Some indication to include this fishery as a component in Development Plans (national or local)
4	Activities towards inclusion (e.g. identification of appropriate policies and actions)
5	Inclusion of this fishery component but no integration with other sector components (e.g. tourism, agriculture)
6	Integration with other sector components (e.g. tourism, agriculture)
7	Fishery component into Development Plans (national or local) in proportion to its contribution to local economy

TABLE 14	Communication
1	No communication
2	The relevant agencies have been identified, but no communication
3	Ad hoc communication and information exchange takes place
4	Regular communication and information exchange takes place
5	Regular meetings and a record of decisions
6	Regular meetings, a record of decisions and actions are taken
7	Regular meetings, a record of decisions, actions are taken, followed up and fed back to relevant individuals

TABLE 15	Economic well-being – management
1	No management actions implemented or strategy developed whatsoever
2	Intention to develop a strategy
3	Structures in place to ensure trans-disciplinary collaboration and stakeholder co-operation (e.g. trans-disciplinary working group or task group)
4	Activities towards implementation (e.g. identification of appropriate actions) but no mechanism for evaluation in place
5	Mechanism for strategy evaluation in place
6	Ongoing evaluation of strategy is taking place and the strategy is adjusted accordingly
7	Strategy incorporates ongoing amendments and is implemented successfully

TABLE 16	Rights allocation process
1	No rights allocated
2	Short term rights allocated
3	Medium term rights allocated
4	Long-term rights allocated and/ or no performance review criteria developed
5	Performance criteria developed but fishery and/or rights holders not assessed
6	Performance criteria developed and fishery and/or rights holders assessed
7	Performance assessment process is effective to achieve social and ecological goals

TABLE 17	Eco-labeling
1	No eco-labelling of this fishery
2	Pre-certified
3	Preparation for certification (addressing issues arising from pre-certification)
4	Applied for certification
5	Eco-labelled/certified
6	Addressing conditions of certification
7	Meeting conditions of certification

TABLE 18	Market security
1	No strategy whatsoever
2	Intention to develop a strategy
3	Market research has been conducted
4	Strategy has been developed
5	Partial implementation of the marketing strategy
6	Strategy is being implemented and continuously evaluated and adjusted
7	Strategy has been successful over time

TABLE 19	Trans-disciplinary
1	No management strategy whatsoever
2	Intention to develop a strategy
3	Structures in place to ensure trans-disciplinary collaboration and stakeholder co-operation (e.g. trans-disciplinary working group or task group)
4	Activities towards implementation (e.g. identification of appropriate management actions) but no mechanism for evaluation in place
5	Mechanism for strategy evaluation in place
6	Ongoing evaluation of strategy is taking place and the strategy is adjusted accordingly
7	Strategy is amended and implemented successfully

TABLE 20	Working groups
1	No structures in place
2	Structures constituted but no meetings yet (e.g. sector specific association)
3	Group meets regularly, agenda only considers target species management and minutes are taken
4	Group meets regularly, agenda includes EAF considerations and minutes are taken
5	Minutes are circulated and adopted
6	Minutes are circulated and adopted and follow-up actions taken
7	Group meets regularly, actions are followed up on and feedback is given on decisions with explanations

TABLE 21	Co-management
1	Not everyone invited to meetings
2	Identify all affected parties
3	Key stakeholders are identified and invited to attend meetings
4	All government sectors attend meetings regularly (resource management, compliance and research)
5	Key government sectors and industry attend meetings regularly
6	Key government sectors and industry and civil society attend meetings regularly
7	All of above attend meetings regularly and broader stakeholder communication occurs (e.g. road shows, public meetings etc)

TABLE 22	Employment equity
1	No policy in place
2	Policy developed but not implemented
3	Less than 50% of the employment equity goals are met
4	50% of the employment equity goals are met
5	65% of the employment equity goals are met
6	80% of the employment equity goals are met
7	All (100%) of the employment equity goals are met

TABLE 23	Management plans
1	No management plan
2	Management plan is in place but no ERA was undertaken
3	ERA has been undertaken to identify issues
4	Management plan has been developed and ERA issues are incorporated into the plan, but plan is not yet implemented
5	Management plan has been implemented but is not being evaluated
6	Mechanisms for monitoring and evaluation of management are in place
7	Management plan is being implemented, evaluated and remedial action is being taken according to the evaluation

TABLE 24	National Plans of Action (NPOAs)
1	No intention to develop a NPOA
2	Intention to develop a NPOA
3	Stakeholder meetings have been held
4	Industry has contributed to the development of a draft NPOA or to the objectives of the NPOA
5	The NPOA has been has been adopted which includes stakeholder comments but not implemented
6	The NPOA has been implemented through regulations (e.g. Permit/ license conditions)
7	The NPOA has been fully legislated and there is good compliance

TABLE 25	Penalties for non-compliance
1	No regulation of EAF considerations
2	Appropriately regulation, but completely inadequate (e.g. fine too small)
3	Appropriate regulation, but 50% inadequate penalty
4	Appropriate regulation, but 75% inadequate penalty
5	Adequate penalty, but no follow through
6	Adequate penalty, but limited follow through
7	Penalties and adequate follow through provide a real incentive for compliance

TABLE 26	Incentives or voluntary mechanisms for compliance
1	No incentives or voluntary mechanism identified
2	Incentives or voluntary mechanism identified
3	Decision taken to implement incentives or voluntary mechanisms
4	Incentives implemented for 1 of the 3 EAF dimensions (i.e. Ecological Human Well-being, and Governance)
5	Incentives implemented for 2 of the 3 EAF dimensions
6	Incentives implemented for all 3 dimensions
7	Adequate incentives act to reward good compliance

TABLE 27	MCS – general
1	Not in place
2	Regular at sea patrols are undertaken.
3	Adequate shore based controls are in place (e.g. in harbours, at landing sites etc.)
4	The special investigation unit functions well
5	Functional VMS system implemented
6	Court system adequately apprehends offenders
7	Regular aerial patrols are undertaken

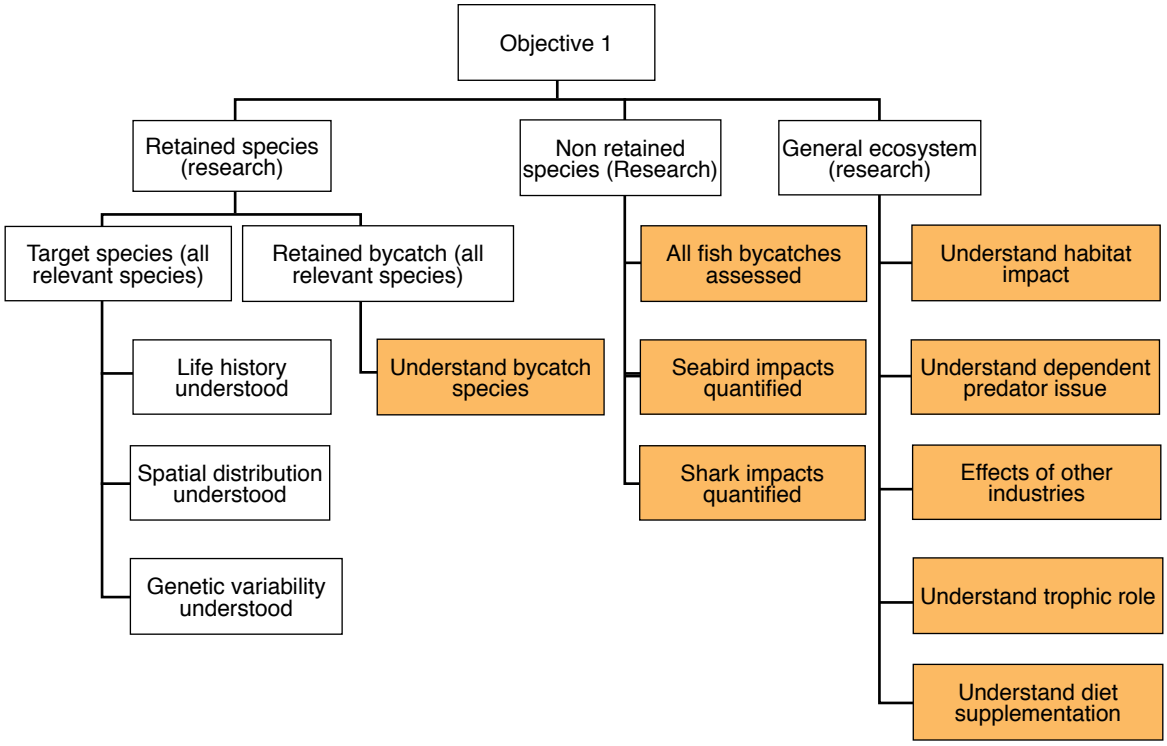
TABLE 28	Trans-boundary stocks
1	No understanding of transboundary stocks
2	Good understanding of shared stocks
3	There is knowledge of a shared stock and intention to share information
4	Information is shared between countries
5	Some harmonisation of management between neighbouring countries
6	Management of shared stock is harmonised between the countries
7	Regional co-operation is operational and has been institutionalized (e.g. FCWC, COREP, CECAF)

TABLE 29	RFMOs
1	No involvement in the above mentioned RFMO
2	Involved in the above mentioned RFMO at observer level i.e. does not yet hold cooperating non member status
3	Cooperating non-member but not participating
4	Cooperating non-member and participating
5	Member, but not participating
6	Participating member
7	Participating member and developing recommendations/ resolutions

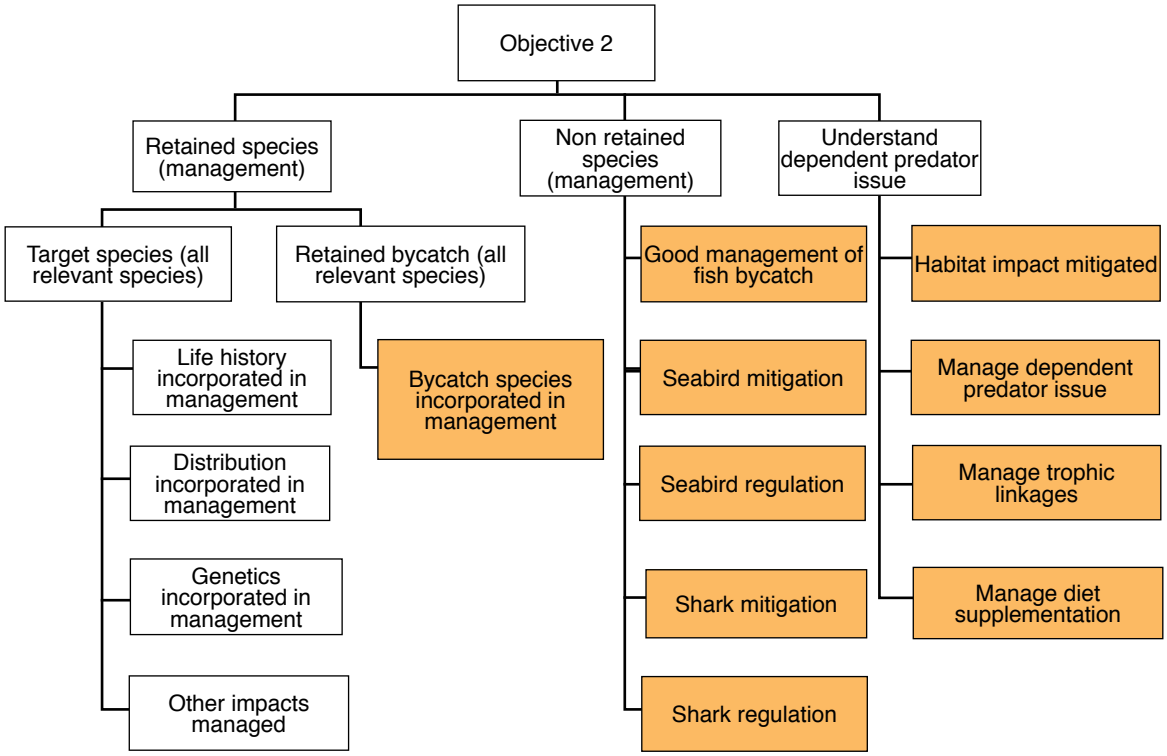
TABLE 30	Traceability
1	No systems in place
2	20% implemented
3	40% implemented
4	60% implemented
5	80% implemented
6	90% implemented
7	Fully implemented

APPENDIX 3
GENERIC COMPONENT TREES USED IN THE IDENTIFICATION OF EAF ISSUES IN A STRUCTURED WAY

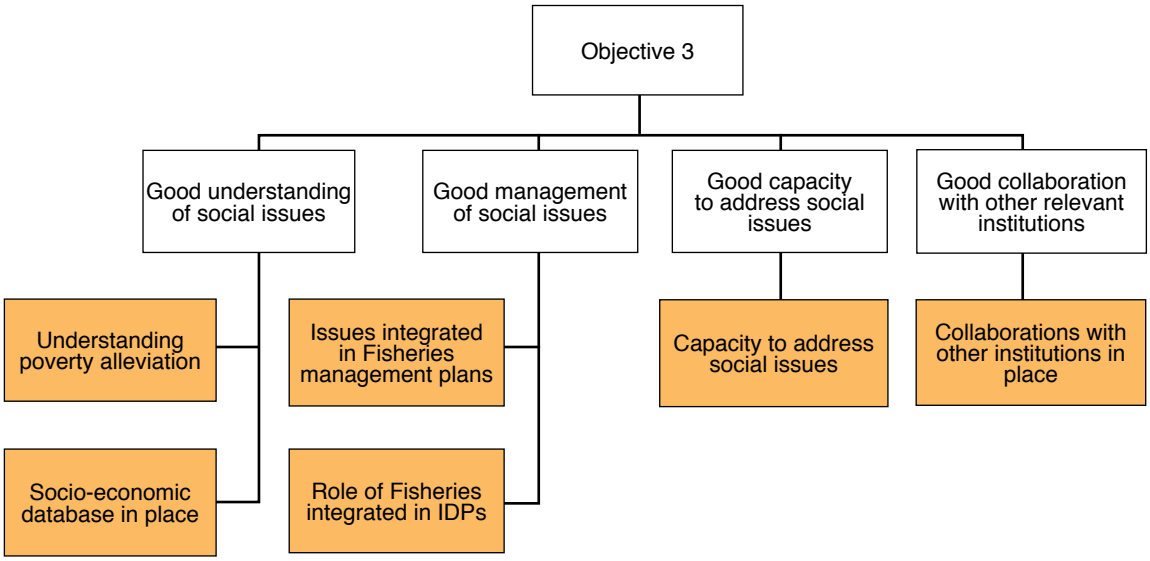
Objective 1: The managing authority has a good understanding of the ecosystem impacts of fisheries including target, non-target and general ecosystem impacts.



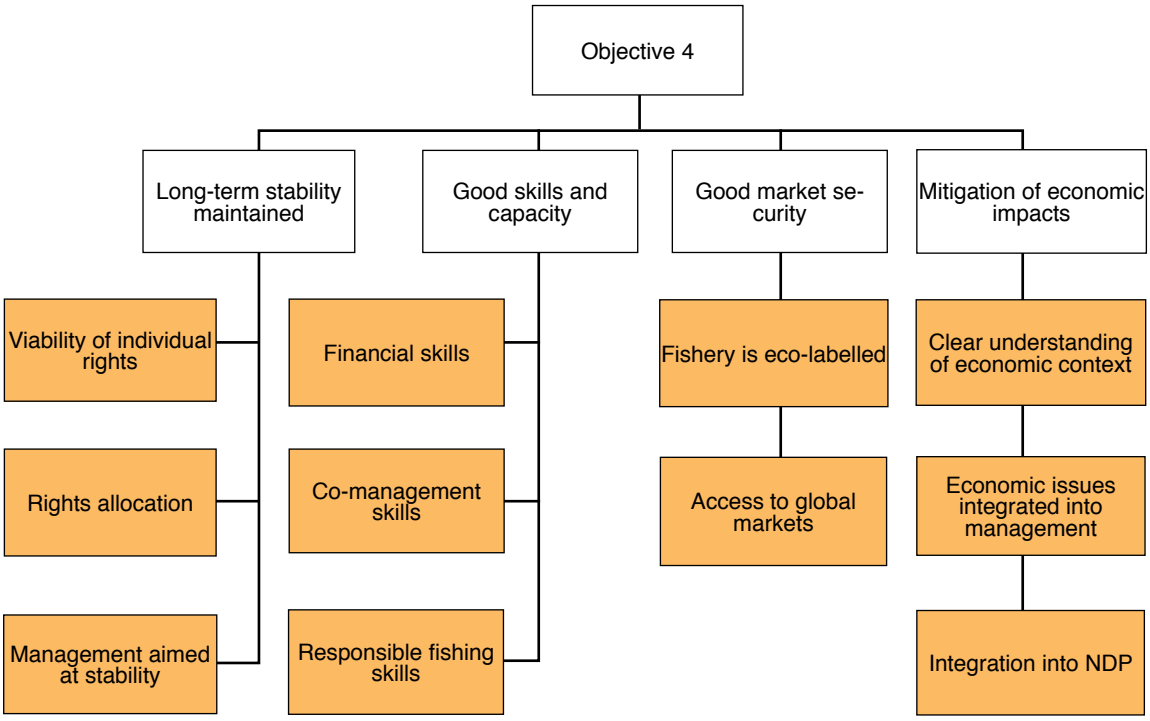
Objective 2: Ecosystem impacts of fisheries are included into management advice.



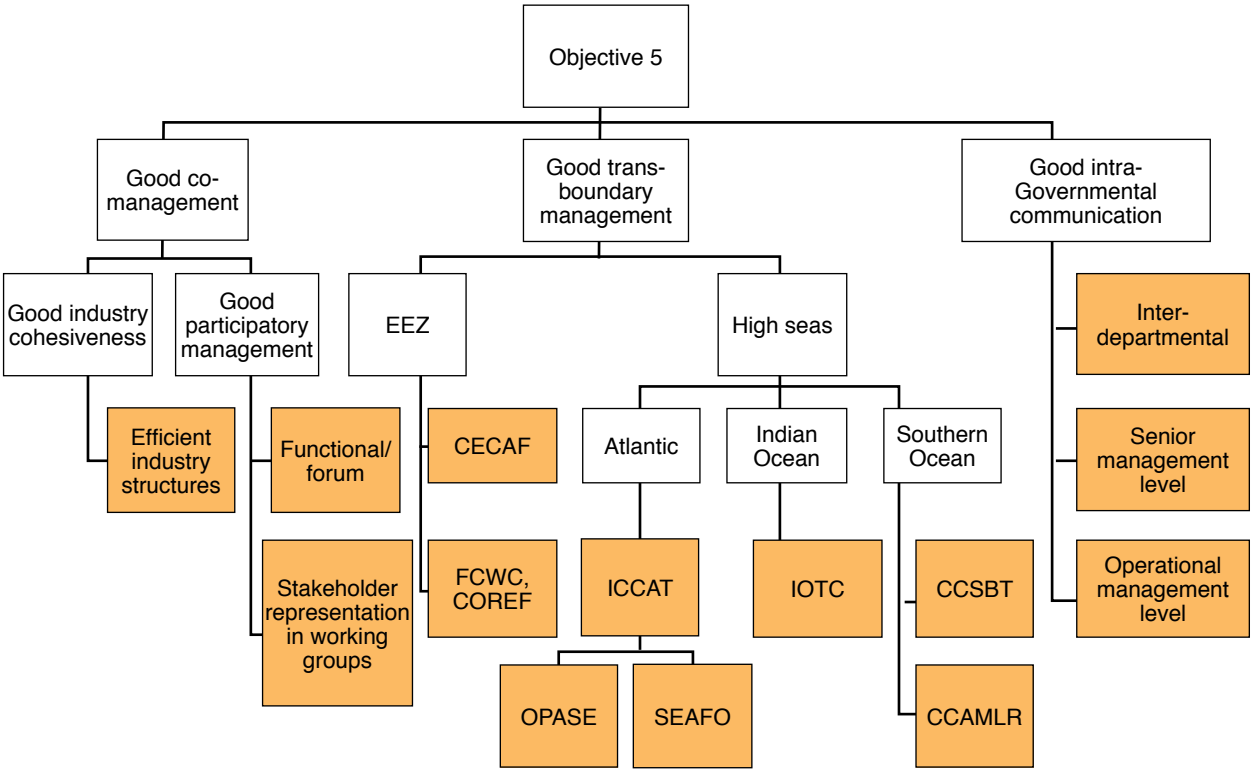
Objective 3: The social wellbeing of dependent fishing communities is accounted for in management advice.



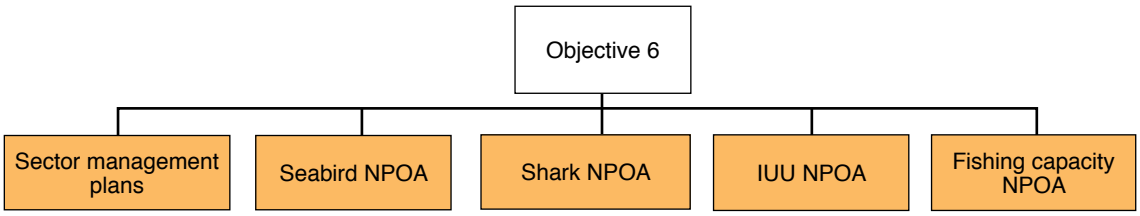
Objective 4: The economic wellbeing of the fishing industry is maintained.



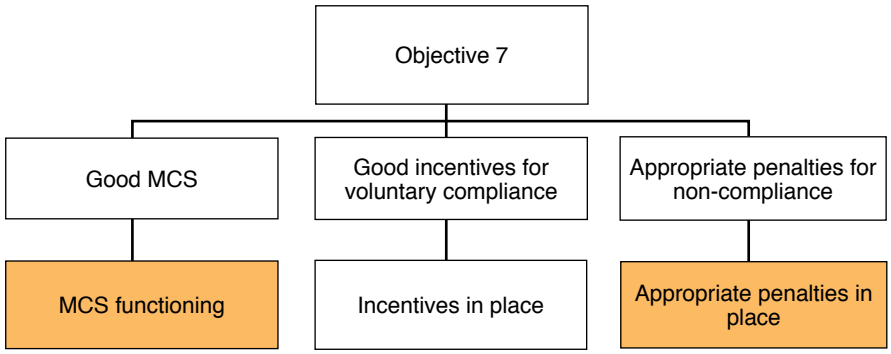
Objective 5: Transparent and participatory management structures ensure good communication and information sharing locally and regionally.



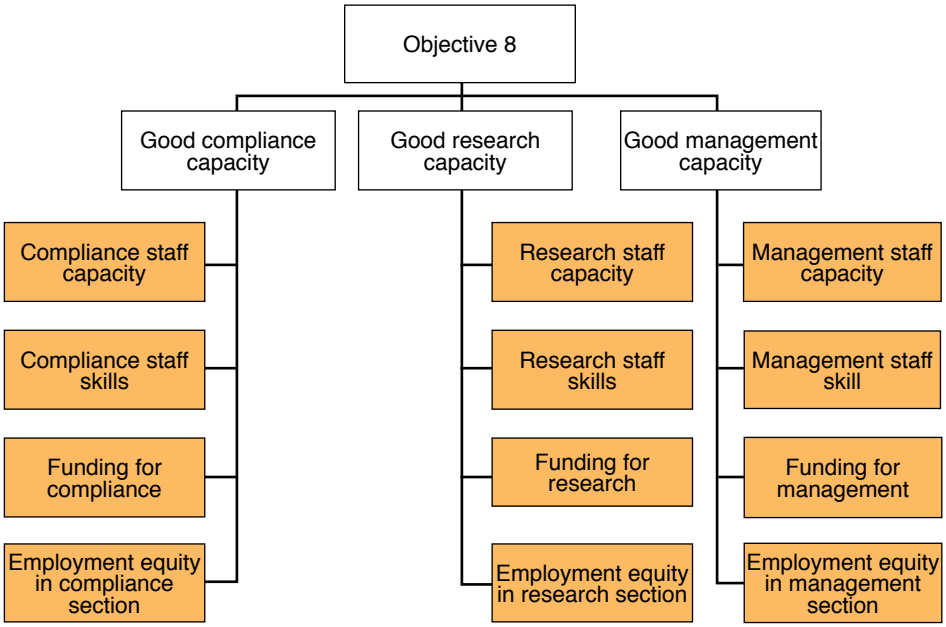
Objective 6: Management plans incorporate EAF considerations.



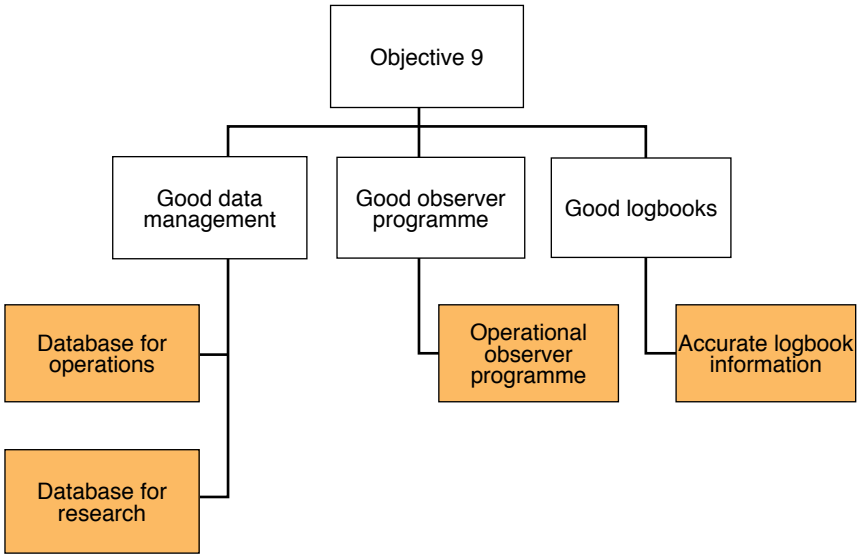
Objective 7: Good compliance to regulations reduces ecosystem impacts of fisheries.



Objective 8: Sufficient capacity, skills, equipment and funding exist to support the implementation of an EAF.



Objective 9: Good data procedures exist to support EAF implementation.



Objective 10: External impacts of fisheries are addressed (e.g. the effect of other sectors, other industries, climate change, etc.).