An overview of the South West Indian Ocean Fisheries Project (SWIOFP) with emphasis on linkages with the IOTC [1]

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1- Introduction

The Large Marine Ecosystems (LMEs) approach has been developed through international collaboration as a tool for enabling ecosystem-based management of oceans and fisheries. LMEs are natural regions of ocean space encompassing coastal waters from river basins and estuaries to the seaward boundary of continental shelves and the outer margins of coastal currents. Their boundaries are based on four ecological criteria: bathymetry, oceanography, productivity, and trophically-related populations (Sherman 1994). They stretch across international boundaries. Nearly 95% of the global yield of fish and other living marine resources are produced in LMEs. So far, 64 LMEs have been defined, covering nearly all land-ocean margins around the world (Sherman 2003).

The Global Environment Facility (GEF) in its International Waters programme recommends that countries sharing an LME should address coastal and marine issues jointly, by analyzing scientific information on transboundary concerns, setting priorities for action, and implementing international governance through national and regional policies. In 2005, following a 4-year project development phase, GEF approved funding and organizational assistance to eight developing countries in the WIO (South Africa, Mozambique, Tanzania, Kenya, Madagascar, Mauritius, Seychelles and Comoros) to assess the Agulhas & Somali Currents LMEs (ASCsLMEs). France likewise pledged assistance owing to targeted research programmes already being conducted in its overseas territories of Reunion Island and Mayotte.

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Many studies on fisheries, human impacts on the environment, and marine ecosystems have been undertaken in the WIO region, nationally or by NGOs (see Okemwa et al. 1995, Sherman et al. 1998, WIOMSA 2005), but until recently these studies were usually sector-based (e.g. fisheries) or issue-based (e.g. turtle bycatch, coastal erosion, coral bleaching) (Francis & Torell 2004). Although several attempts were made to integrate projects and information, the fragmented system of the past prevails in many areas. The ultimate objective of linking science to coherent management structures and governance cannot be achieved without exchange of relevant scientific information and promotion of regional capacity (human, institutional and infrastructure).

The South West Indian Ocean Fisheries Project (SWIOFP) is one of three inter-linked projects financed by GEF for the ASCsLMEs. The overarching objectives of the ASCsLMEs programmes are i) to support the capture of the requisite fisheries and environmental data to fill information gaps for assessment, development and management purposes; ii) to improve regional scientific, institutional, human and governance capacity; and iii) to promote the long-term sustainable use of the regional resources using an ecosystem-based approach. Within the ASCsLMEs programme, SWIOFP deals with offshore fish and fisheries, the Agulhas & Somali Currents LME project (singular acronym ASLME to distinguish from ASCsLMEs programme) addresses productivity, ecosystem health, pollution and nearshore fisheries, and the Western Indian Ocean Land Based Impacts on the Marine Environment Project (WIO-LaB) addresses coastal pollution and ecosystem health. All three projects also include socio-economic aspects and the management and governance of coastal and marine resources. In a novel programmatic approach, the three projects are implemented separately by the three GEF agencies: SWIOFP by World Bank; ASLME by UNDP; and WIO-Lab by UNEP. In theory, the programmatic approach should achieve greater integration towards the development of the transboundary diagnostic analyses (TDAs) and strategic action plans (SAPs) than has been the case with previous GEF International Waters initiatives.

SWIOFP involves 9 countries: Kenya, Tanzania (including Zanzibar), Mozambique, South Africa (eastern coast only), Madagascar, Mauritius, Seychelles, Comoros and France (by virtue of its islands in the region). Somalia has observer status.

In this paper, we provide general information on the South West Indian Ocean Fisheries Project within the ASCLsMEs programme, the preparation phase and proposed organizational structures and clarify the complement brought by this project to research activities managed by the Indian Ocean Tuna Commission (IOTC).

2- Geographical scope

The West Indian Ocean (WIO) is unique in the world's oceans, owing to its highly dynamic environment and strong seasonal variability induced by the monsoon system (Dietrich, 1973). One of the most intense and nutrient-rich coastal upwelling occurs seasonally off Somalia, in conjunction with the onset of the south-west (summer) monsoon. During the opposite monsoon (north-east, in winter) the current reverses and flows southward, with a dramatic change of the water properties compared with the upwelling system. The Mozambique Channel represents another peculiar area characterized by a strong meso-scale activity, with southward flowing alternating cyclonic-anticyclonic eddies playing an important role in transporting offshore the inshore phytoplankton-rich waters. The warm tropical waters transported through the Mozambique Channel and those flowing from the East Madagascar Current merge into the Agulhas current flowing to the south, all along the South African coast (Lutjeharms 1988). Owing to these different oceanographic and geographic features, two LMEs were defined: a) the Agulhas Current LME stretching from the northern Mozambique Channel to Cape Agulhas and b) the Somali Current LME extending from the Comoros Islands and the northern tip of Madagascar northwards to the Horn of Africa. These systems play interactively with a strong influence exerted by the South Equatorial Current. This current is funneled across the Mascarene Ridge, an ecosystem in itself that links the island countries such as Mauritius and Seychelles to the rest of

the project. Both LMEs (and their extension to the East) exhibit a high fisheries potential and have a profound basin-wide and transboundary influence over the region's ecosystems, biodiversity and fishery resources (Spencer et al. 2005).

The SWIOFP area is restricted to the ocean between the coast and the outer boundaries of the national 200 miles Exclusive Economic Zones of the participant countries (Figure 1) and it does not, therefore, include the entire LME region which extends further offshore. The SWIOFP inshore boundaries are defined by individual countries, but are set sufficiently far away from the coast to not duplicate research undertaken by the ASLME project, which is *inter-alia* responsible for near-shore fisheries, or by other national projects addressing coastal and near-shore areas

3- Preparation phase and objectives

3.1. Preparation phase

The very first step was a plenary meeting organized in December 2000 to discuss a possible strategy for collective action in protecting and sustainably developing shared SWIO marine resources. A project preparation phase began in January 2002, with GEF funding, when the IDA (International Development Association, representing GEF) signed an agreement with the Government of Mozambique to coordinate project preparation. The preparation phase was structured into 5 specific workshops with individual countries volunteering for chairing them: Science plan by South Africa; Data management by Kenya; Operations and procurement by Tanzania; Project management by Madagascar; Legal issues by France; while Secretariat was held by Mozambique. Five Plenary sessions in Maputo were attended by the core SWIOFP preparation team and senior government officials of member countries. The plenary sessions informed governments of progress made, solicited high level buy-in, and sought guidance relevant to specific country needs. The resulting outcome was a scientific and capacity-building approach for an environmentally sustainable management of fisheries. The project brief was submitted to GEF late in 2005, and was approved for funding

3.2 Project aims and higher-level objectives

Based on the needs assessment made at the regional level, the aims of SWIOFP are to:

- Define the current state (and potentialities) of deep water fisheries and contribute to create regionally based deep water fisheries agreements;
- Develop a science-based capacity within the member countries to support resource management actions and overall policy development, to achieve sustainable resource management objectives;
- Through a joint Implementing Agency and Participating Country process, develop a process for continually updating the TDAs and SAPs to guide long-term policy for sustainable use.

The higher level objectives of SWIOFP are to partially fulfil commitments made by the member countries at the World Summit on Sustainable Development in Johannesburg in 2002 (WSSD), i.e. to introduce an ecosystems approach to marine resource assessment and management by 2010; designate a network of marine protected areas by 2012; and restore and maintain fish stocks at maximum sustainable yield (MSY) levels by 2015 (Sherman 2003). The objective of poverty alleviation is fostered through a programme of World Bank development assistance that places emphasis on environmental sustainability and social equity.

4- Structure of SWIOFP

4.1 Components

The SWIOFP is structured into six components, two dedicated to fisheries management issues and the other four focusing on research of crustacean, pelagic and demersal fish resources and biodiversity (Table 1). Each component is subdivided into sub-components which are further subdivided into specific activities; a total of some 55 activities have been described, each with

specific outputs per component which also serves as the basis for costing and manpower needs. All the countries participate in the core components of data and information, monitoring of fishing effort and catches, and strengthening of regional and national fisheries management (components 1 and 6) but countries need not participate in research components that are of lesser importance to their individual needs. For example, Seychelles and Reunion do not have crustacean fisheries, and will thus not participate in the crustacean component (see Table 2). Conversely, shallow-water prawns support the largest Mozambican fishery, but is rated lowly (L) in SWIOFP because it is the subject of studies elsewhere. In this way, each country is an active participant in SWIOFP and the structures around which research, data collection, capacity-building and management devices develop are needs- and country-driven.

4.2 Implementation steps

SWIOFP implementation is scheduled for mid-2007 and will take place in three stages.

1. The first 12-18 month period deals with the collection and analysis of relevant existing data, and will include a data-gap analysis at component level to guide the planning of research surveys (Figure 2). This planning phase will allow for synergies to be created with the ASLME. During this period, data collection, archiving and analysis procedures for new data will be developed, and capacity building commenced.
2 The second stage of 24-36 months is for the collection of new data to fill the gaps identified in stage 1. Regional surveys are done at sea using ships and observers. The surveys will be aimed at collecting information on new and exploited fish stocks, their distribution, stock status and potential, biological parameters and genetic structure.
3 The third 18-24 month period is for preparing the TDAs and SAPs. This stage may also lead to the development of long-term follow-on projects to SWIOFP.

4.3. Project management structure

The SWIOFP management structure must address:

- overall coordination of a coherent regional programme;
- monitoring of individual projects to ensure that they meet regional objectives;
- effective provision of regional support services such as procurement;
- monitoring and responding to the evolving regional and international context.

The management structure consists of three tiers (Figure 3):

- a Regional Political Steering Committee authorized to act for governments at annual strategy meetings; its functions will later be ceded to the newly constituted (2005) FAO South West Indian Ocean Fisheries Commission (SWIOFC), to which SWIOFP will then provide advice on regional fisheries issues, except for tuna resources whose management is the responsibility of the IOTC;
- a Regional Management Unit (RMU), staffed by consultants to act as a core operational unit and primary conduit to the World Bank. The RMU will administer the national management units (see below) and provide financial, regional procurement, ship coordination and harmonization services;
- Small national management units (NMUs), staffed by civil servants and accountable to the RMU for timely implementation of projects in national waters and expenditure. The technical aspects of SWIOFP will be implemented at this level, and the NMUs will also accommodate the component leaders (one per component), responsible for coordinating all the projects within a component, across all participating SWIOFP countries.

4.4. Memorandum of Understanding (MOU)

All the countries participating in SWIOFP are signatories to the Law of the Sea Convention (UNCLOS), which covers issues pertaining to limits of maritime zones, rights of navigation, protection and preservation of the marine environment, scientific research and activities on the seabed beyond the limits of national jurisdictions.

A separate MOU developed between the World Bank and SWIOFP member countries for transboundary projects confirm additional agreements reached on rights of access to sovereign waters (and in some cases to marine reserves), research ships and personnel, access to samples, data and research reports generated by SWIOFP, and intellectual property rights to data. A cooperation clause in the MOU specifies that member states will make research facilities and equipment available on an *ad hoc* basis, as in-kind contributions to the project. All catches made by SWIOFP ships must be reported to the RMU, and the proceeds from the sale of catches are to be used within the project at its discretion. Compliance with all statutory and legal requirements on the import and export of marine species is specified.

4.5. Funding sources

The bulk of the funding for SWIOFP is from a GEF project grant (Operational Program 8: International Waters – Waterbody-based) which finances all components except for the biodiversity projects in component 6. Funding for biodiversity projects come from the GEF Biodiversity Focal Area (Operational Program 2). The total GEF grant is US$ 12 million (US$ 9 M from OP8 and US$ 3 M from OP2). Other sources include co-finance from bilateral donors, which currently include France and Norway, and very significant in-kind and cash contributions from SWIOFP member countries, amounting US$ 10.64 million. The baseline cost of each component has been estimated from the national and limited regional activities related to the monitoring and management of the marine resources that each country would pursue in the absence of a GEF funding. The overall baseline is estimated to US$ 80.0 million. The overall project cost, pooling baseline and GEF incremental, is US$ 109 million. The detailed costs by component and finance source are summarized in Table 3. The level of GEF funding received by each member country (except for France which is not eligible for GEF support) is structured according to its *pro-rata* contribution to the project, and is negotiated through project grant agreements between the World Bank and individual governments.

5- Partnership

The 9 SWIOFP member states will implement the project in partnership with two South African based NGOs, the African Coelacanth Environment Program (ACEP) and the Oceanographic Research Institute (ORI) in Durban. ORI played a major consultative role in preparing the SWIOFP project brief and the institute specializes in Indian Ocean biota and fisheries. ORI is also involved in several other collaborative transboundary marine research projects along the southeast African coast. ACEP focuses on biodiversity studies (with the coelacanth being the target, but non exclusive, species) and related environmental aspects of the SWIO region. France participates through research institutions, namely the *Institut de Recherche pour le Developpement* (IRD) and the *Institut Français de Recherche pour l'Exploitation de la Mer* (Ifremer). Additional French resources (including ships time and StatBase, a database package) are provided by the FFEM (*Fonds Français pour l'Environnement Mondial*) in order to support activities on pelagic fisheries and their effect on the biodiversity (marine mammals, seabirds and marine turtles). More details are given in the following section. Norway is offering ship time to the project through the Fridtjof Nansen Program, and South Africa will also make ship time available for use in SWIOFP. FAO has recently (2004) established a fisheries commission (South West Indian Ocean Fisheries Commission, SWIOFC) as an advisory fisheries body for the management and development of fisheries within the Exclusive Economic Zone of the SWIO coastal states.

Several regional agreements or institutions (e.g. Nairobi Convention, New Partnership for African Development (NEPAD), Southern African Development Community (SADC), Indian Ocean Commission (IOC), and Indian Ocean Tuna Commission (IOTC)) operate in the ASCsLMEs region, with mandates addressing a variety of developmental and fisheries concerns. SWIOFP is closely aligned with the priorities identified in marine resource management by these bodies, and can be used as an instrument to act upon some of the strategies (e.g. SWIOFP large pelagic fisheries results will be useful to the IOTC).

6- A focus on two SWIOFP components closely related to IOTC activities

6.1. Large pelagic fish (SWIOFP sub-component 4.1)

This component is specifically designed to strengthen the projects of the Indian Ocean Tuna Commission (IOTC) by focusing on activities related to smaller-scale fisheries and by incrementally adding to the design of the IOTC Regional Tuna Tagging Programme (RTTP) by deploying archival popup and sonic tags. Large pelagic fishes represent a valuable resource with a potential for increased socio-economic returns for local countries. They also represent one of the best examples of a shared regional resource. The SWIOFP countries wish to take rightful ownership of these resources in their waters, but this is compromised through the lack of biological baselines throughout the region to support appropriate management. SWIOFP can help in filling these gaps.

GEF funds will finance wet leasing of ships time, technical assistance, ships gear, logistical expenses associated with ship cruises and data collection, remote sensing, trainings, workshops, pilot studies on gear optimization, and data analysis.

The SWIOFP large pelagic subcomponent addresses three focus areas: development of anchored-FAD fisheries, gear optimization in deep sea fisheries (essentially longline), study of migration and movements of species not covered by the IOTC tagging activities.

a) Development of anchored-FAD fisheries

Several countries wish to strengthen research and fisheries related to FADs in their waters. The objectives are i) to reduce the fishing pressure on the coastal shelves and inshore resources and ii) to develop new tools and techniques to retain a migrating resource for exploitation by local fishers.

The research part of this activity is to estimate fidelity and residency of fish at FADs, estimate turnover rates between associated and non-associated fishes, define appropriate depths of fishing and assess seasonal variations. Techniques developed during FADIO and by the University of Hawaii will be applied in this activity (listening stations, various types of tags, hydro-acoustics). A provision of US$ 350 000 is planned in the SWIOFP budget for purchase acoustic devices and tags.

An economic and social assessment will complement the technical and scientific outcome. Past experiences with FADs have shown that the factor controlling success is the ability of maintaining the devices on the long term after deployment. This should be the responsibility of individual states, but there is a need for building capacity and technical management in each country for organising a network of skilled FAD technicians across the region. The fisher communities have to acknowledge FADs as a common asset and themselves control abuse and any pirating of these devices.

The countries that have expressed strong intent for this activity are, in alphabetic order, Comoros, Kenya, Madagascar, Mauritius, Seychelles and Tanzania.

b) Gear optimization in deep sea fisheries

Semi-industrial longline fisheries are among possible options for riparian countries to exploit pelagic resources in their EEZ. The objectives of this SWIOFP activity are i) to improve fishing strategies on target species (e.g. swordfish, bigeye, albacore) and ii) to reduce by-catch (e.g. on turtles, sharks, seabirds, etc).

The research part concerns i) the introduction and testing of new ways to deploy the monofilament longline system at given depths, especially to reduce the incidental catch of sensitive species and ii) a study of the vertical habitat of large pelagic fish (mainly swordfish, bigeye and albacore) in relation with physical measurements and acoustic surveys (diel migration of mesopelagics).

The countries that have expressed strong intent for this activity are Mauritius, South Africa, Seychelles and France (Reunion) as an extension of ongoing projects for the two last ones.

c) Migration and movements

This activity targets swordfish, albacore and bigeye. Swordfish and albacore are not presently included in the RTTP whereas bigeye is included but tagging is confined to smaller specimens and in different areas. The SWIO is one of the most important swordfish grounds in the Indian Ocean and an understanding of swordfish movement in this region will allow for more appropriate fisheries management and control measures to be implemented for this species. Bigeye and albacore represent alternate species for the longliners, provided that the boats are equipped with line shooters to enable deep water fishing down to 500 m. The bigeye studied by the RTTP are mostly juveniles tagged with conventional tags although some internal archival tags are deployed on a few adult fish. Tagging with PATs (Pop up Archival Tags) in the SWIO will therefore substantially complement the IOTC tag-recapture database in areas where the exploitation rate is lower than in the equatorial waters. This will provide valuable information for diversification of fishing tactics and strategies in the SWIOFP region.

The objectives of this component are thus to study the movement patterns of swordfish, bigeye and albacore (horizontal and vertical), to design habitat-based models for calibrating cpue indices and to produce guidelines for alternate fishing tactics and strategies between the different species targeted by longline.

A provision of US$ 400 000 is planned in the SWIOFP budget to purchase the PATs. The countries mostly involved in this activity are Mauritius, South Africa, Seychelles and France (Reunion).

6.2. Mainstreaming biodiversity in national and regional fisheries management (SWIOFP Component 5)

As a specific contribution to the GEF Biodiversity Focal Area, this component will investigate relationships between fisheries, biodiversity processes and species diversity and elaborate how these relationships could be better managed at national and regional levels. Although many non-commercial species (whales, dolphins, sharks, turtles, seabirds) are the focus of conservation efforts, there are gaps in knowledge regarding the impact of certain fisheries activities on specific populations and habitats. The SWIOFP will provide funds to study the effects of fisheries on non-commercial marine resources and will deepen existing knowledge on anthropogenic threats to marine resources. GEF funds will also finance baseline assessments of fisheries interactions with other marine species, GIS mapping of key marine species, assessments of alternative economic potential of non-commercial species and identification of bio-indicator species.

This component will naturally interact and exchange information with other initiatives such as the FAO project dealing with bycatch reduction devices (BRDs) and the Bycatch Working Group of the IOTC.

In SWIOFP, this component covers 3 focus areas:

a) State of knowledge on marine biodiversity, with emphasis on non consumptive and endangered resources: i) Data rescue and gathering for inclusion in the Data Atlas; and ii) identification and assessment of key non-consumptive species and ecosystem relationships that could provide potential sources of income. A project studying movements of green turtles between spawning sites and foraging areas has already been proposed by France and will be financed by the FFEM.

b) Interaction with fisheries: i) Observer network on-board research and fishing vessels to monitor occurrence of by-catch: the institution of observers aboard fishing vessels is already a priority, this programme simply requires that they are trained to accurately record the presence of non-consumptive species identified by focus area 1; ii) a Regional Marine Mammal Observatory should be set up and supported by National networks: this

should be partly funded by France (FFEM) and the *Office National de la Chasse et de la Faune Sauvage* in Mayotte will act as the lead partner. For an extension to other riparian countries, local costs should be partly covered by counterpart funding. The interaction between false killer whale (notably *Pseudorca crassidens)* and longline fisheries will have a high priority because the predation caused by these killer whales can hamper the economical viability of such fisheries.

c) Bio-indicators of ecosystem health: the survey of seabirds populations on the long term has already been used in the southern seas to track environmental changes (regime shifts) (Weimerskirch et al 2003). Similar projects are underway in the SWIO region (MASMA funding) and shall be pursued under SWIOFP. Recent experiments of Argos tracking on seabirds (great frigates) illustrate foraging strategies that are strongly linked to meso-scale features. Information gathered on the trophic behaviour of seabirds and induced demographic responses can be used as a surrogate tool to assess the health of marine ecosystems (and consequently the environmental impact of fisheries).

7- Conclusion

The 9 member countries of SWIOFP are on the verge of implementing one of the largest collaborative marine research and capacity building projects in history. It is also the first time that the 3 GEF implementing agencies of UNDP, UNEP and the World Bank from the outset attempt to lead separate projects in a programmatic approach, to investigate the productivity, fisheries and land-based impacts of an LME system. It is a very challenging initiative as many difficulties may arise, among them the sharing of limited manpower and ships time.

This is why liaison with other regional projects and bodies must be optimized. It is notably the case with the IOTC for the components regarding the pelagic fisheries and the conservation biodiversity, with the aim of reducing as much as possible the detrimental effects of fishing on the ecosystems. Information exchange and crossed attendance to technical meetings should be promoted between SWIOFP and IOTC.

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Table 1: An abbreviated structure of the 6 SWIOFP components, including subcomponents and activities.

Component	Subcomponent	Activities
Component 1: Data gap analysis, data archiving and Information Technology	1.1 Fisheries data collection and evaluation	• Review and evaluation of key national datasets of fish and fisheries. • Sourcing of published information on SWIO from peer-reviewed journals, grey literature, conference proceedings and FAO manuals. • Repatriation and evaluation of data from national academic and research institutions, international scientific surveys, programmes and commissions, and selected foreign fishing companies. • Sourcing and description of unconventional and outdated data held in formats that are incompatible with modern operating systems and software including undigitised raw data. • Inter-calibration of national and historic data sets
	1.2 Compiling of a data atlas for SWIOFP	• Indexing and storage of data • Assessing the quality of the various data types, and their compatibility • Gap-analysis to determine projects to be supported by SWIOFP • Valuation of data to serve as an in-kind contribution from member countries to SWIOFP
	1.3 Establishment of IT, data handling and communications systems	• Upgrading / procurement of national IT and communications infrastructure • Training of skilled manpower for data handling • New data handling • Review of existing database systems for adoption by SWIOFP
Component 2: Assessment and sustainable utilization of crustaceans	2.1 Deep-water crustaceans	• Distribution, stock discrimination and biological reference points of key resources • Ship-based surveys to assess the potential of new and existing fisheries. • By-catch assessment: utilization, reduction and ecosystems impacts
	2.2 Shallow-water crustaceans	• Distribution, stock discrimination and biological reference points of key resources. • Ship-based surveys to assess the potential of new and existing fisheries. • By-catch assessment: utilization, reduction and ecosystems impacts. • Impact of river run-off on prawn larval recruitment. • Optimization of artisanal shallow-water lobster fisheries: Pilot studies
Component 3: Assessment and sustainable utilization of demersal fish (excluding crustaceans)	3.1 Deep-water demersal fish	• Distribution, stock discrimination and biological reference points of key resources • Ship-based surveys to assess the potential of new and existing fisheries. • Resource assessments • By-catch assessment: utilization, reduction and ecosystems impacts
	3.1 Shallow water demersal fish	• Distribution, stock discrimination and biological reference points of key resources • Ship-based surveys to assess the potential of new and existing fisheries. • Resource assessments • By-catch assessment: utilization, reduction and ecosystems impacts.

Component 4: Assessment and sustainable utilization of pelagic fish	4.1 Large pelagic species	• Development of FAD fisheries • Gear optimization in relation to the habitat • Migration and movement
	4.2 Small pelagic species	• Distribution, stock discrimination and biological reference points of key resources • Surveys to assess the potential of new and existing fisheries • Resource assessments • Gear optimization & development of FADs.
Component 5: Mainstreaming biodiversity in national and regional fisheries management	5.1 State of knowledge of non consumptive resources and marine biodiversity	• Identification and mapping of major biodiversity hot spots of the region • Distribution, movements, relative abundance and habitat preferences of marine mammals and sea turtles • Trophic interactions between top predators in the region • Capacity building on marine mammals identification and monitoring
	5.2 Interactions with fisheries	• Interactions between cetaceans, turtles and longline fisheries • Potential impact of changes on biodiversity resulting from fishing practices, including the use of FADs • Regional approach to by-catch assessment and reduction in all fishery types • Classification of main zones concerned by incidental catches
	5.3 Bio-indicators of ecosystem health	• Development of management tools based on seabirds populations monitoring at a regional scale
Component 6: Strengthening regional and national fisheries management	6.1 Identification of relevant national and international legislation	• Documentation of legislation, protocols and guiding principles relevant to SWIOFP
	6.2 Harmonization of legislation between countries	• Review of existing studies on harmonization of fisheries policy • Identify common and conflicting items • Implementation of an action plan
	6.3 Development of regional resource management structures and capacity	• Support development of management plans and procedures through the framework of the SWIOFC • Develop the administrative capacity for participating countries to endorse regional management initiatives • Development of a support base from the participating countries • Establishment of a functional working relationship with the SWIOFC
	6.4 SWIOFP administration, national and regional facilities	• Development of national management capacity and infrastructure • Development of a regional management capacity

Table 2: Involvement of the 9 participant countries into components and subcomponents of SWIOFP, based on needs assessments.

Participation is indicated at 3 levels: H = High priority; M = Medium priority; L = Low priority. Blank cells indicate that a country does not participate in a subcomponent. The countries responsible for the coordination of each component are indicated with a black cell.

Components	Topic	Comoros	Seychelles	Mauritius	Madagascar	Kenya	Tanzania	Mozambique	South Africa	France
1	**Data & Information**									
	Data collection	H	H	H	H	H	H	H	H	H
	Data atlas	H	H	H	H	H	H	H	H	H
	IT systems	H	H	H	H	H	H	H	H	H
2	**Crustaceans resources**									
	Deep		L		H	H	H	H	H	
	Shallow				H	M	H	L	M	
3	**Demersal resources**									
	Deep		H	L	H	H	H	M	L	
	Shallow	H	M		M	M	M	M	L	
4	**Pelagic resources**									
	Large	H	H	H	H	H	H	M	H	H
	Small	L	M		H	M	L	H	L	
5	**Biodiversity**									
	State of knowledge	M	H	L	L	L	M	L	L	H
	Interaction with fisheries	M	H	L	L	M	L	L	L	H
	Bio-indicators	M	H	L	L	M	L	L	L	H
6	**Management**									
	All subcomponents	H	H	H	H	H	H	H	H	H

Table 3. Projected cost by component and finance source (in millions US$).
Top: Breakdown of GEF Alternative by component. Bottom : Summary of co-financing of the GEF Alternative for SWIOFP

Component	Baseline Cost	SWIOFP Associated financing	GEF Incremental				Total GEF Alternative (Baseline + Incremental)
			GEF Financing (OP 8+2)	Gov. Cont.	Other Co-Financing	Total GEF Increment	
1: Data and Information Technology	2.30	0.65	1.90	1.13	0.30	3.33	6.3
2: Assessment and Sustainable Use of Crustaceans	14.10	0.95	2.90	0.82	0.00	3.72	18.8
3: Assessment and Sustainable Use of Demersal Fish	14.50	0.95	2.30	1.20	1.08	4.58	20.1
4: Assessment and Sustainable Use of Pelagic Fish	39.20	0.95	2.40	1.78	1.61	5.79	46.0
5: Mainstreaming biodiversity in national and regional fisheries management	5.20	1.60	0.50	0.05	0.30	0.85	7.7
6: Strengthening Regional Project Management	5.50	0.35	2.00	1.67	0.70	4.37	10.2
Total	**80.80**	**5.45**	**12.00**	**6.65**	**3.99**	**22.64**	**109.0**

Financing		**Amount**
Co-Financing (in-kind and cash)	France	1.00
	Norway (research vessel)	2.27
	Seychelles (research vessels)	0.02
	SWIOFC	0.70
Government Contributions	Comoros, Kenya, Madagascar, Mauritius, Mozambique, Seychelles, South Africa, Tanzania	6.65
	Co-Financing Sub-total	10.64
GEF Financing		12.0
	Total with Incremental Cost (including PDF of 0.725)	**22.64**

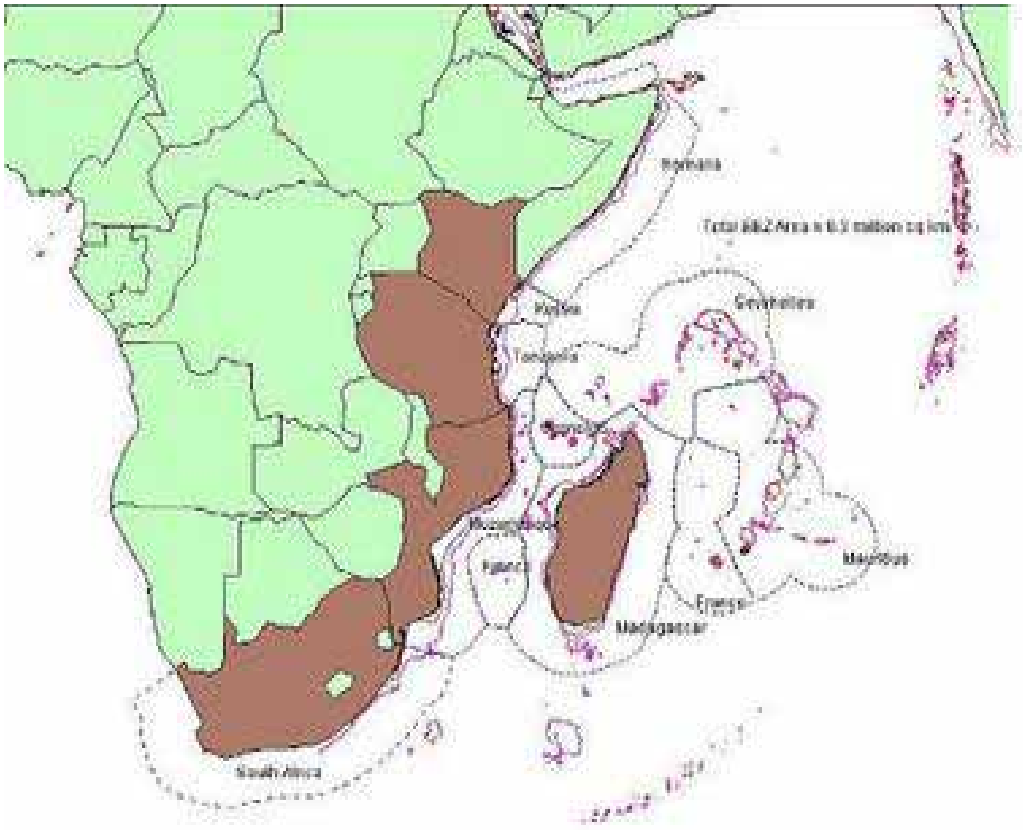

Figure 1. Map of the region covered by the SWIOFP

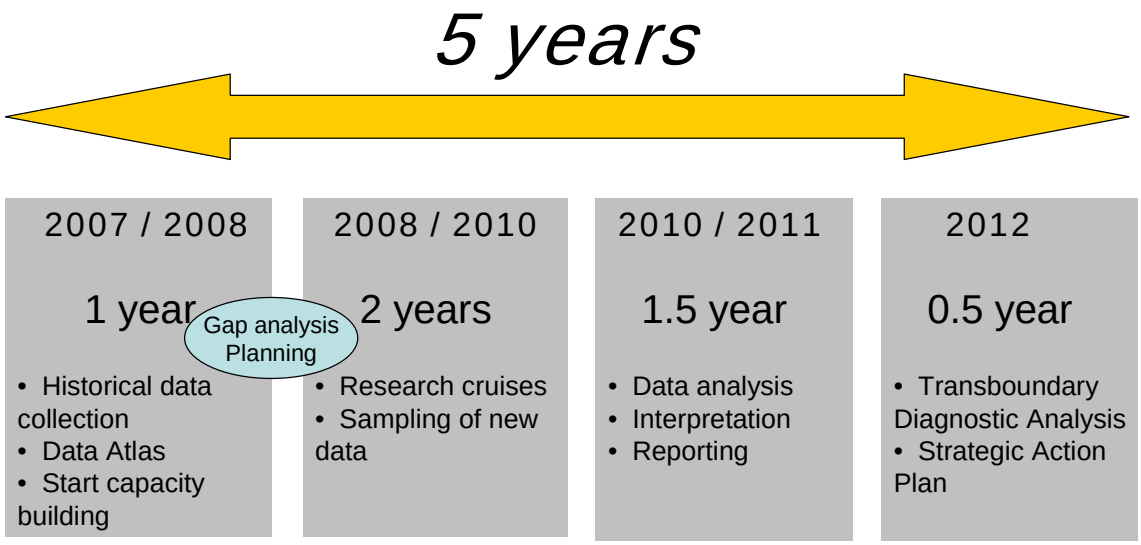

Figure 2. The implementation strategy of SWIOFP, showing the 3 phases of data collection and a gap-analysis, research cruises, and the assessment and drafting of the TDA and SAPs for future management of the region.

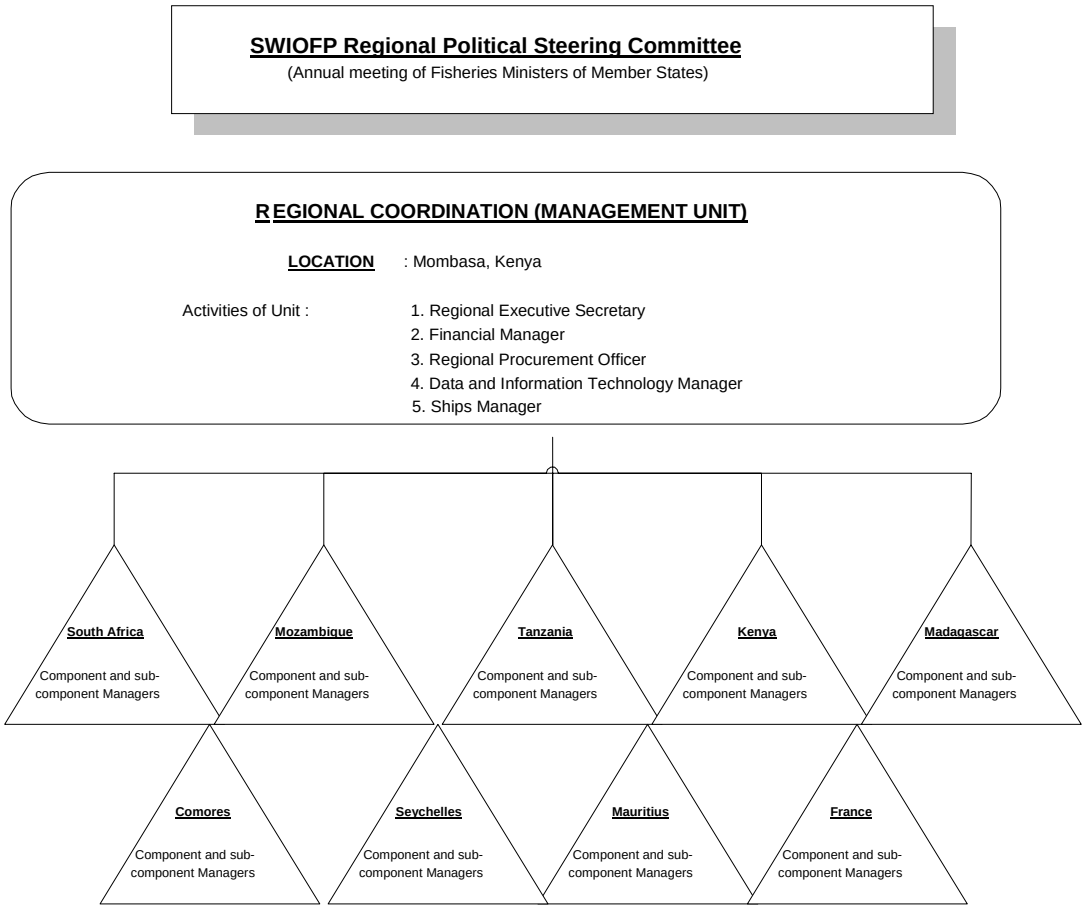

Figure 3. An organizational diagram of the 3 tiers of the SWIOFP Project management structure.