



AFRICAN UNION

STATUS OF FISHERIES OBSERVER PROGRAMMES IN SOUTHERN AFRICA AND A FRAMEWORK FOR A SEA-BASED REGIONAL FISHERIES OBSERVER PROGRAMME



**AFRICAN UNION
INTERAFRICAN BUREAU
FOR ANIMAL RESOURCES**



**STATUS OF FISHERIES OBSERVER PROGRAMMES IN
SOUTHERN AFRICA AND
A FRAMEWORK FOR A SEA-BASED REGIONAL FISHERIES
OBSERVER PROGRAMME**

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Citation: AU-IBAR 2016. Status of Fisheries Observer Programmes in Southern Africa and a framework for Sea-based Regional Fisheries Observer Programme. AU-IBAR Reports

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Published by AU-IBAR, Nairobi, Kenya

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ISBN 978-9966-1659-5-4

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List of abbreviations and acronyms

ATF	Authorisation to Fish
AU	African Union
ABNJ	Areas Beyond National Jurisdiction
ADNAP	National Fisheries Administration
BCC	Benguela Current Commission
CCAMLR	Convention on the Conservation of Antarctic Marine Living Resources
CCSBT	Convention for the Conservation of Southern Bluefin Tuna
CMM	Conservation or Management Measures
CNCP	Cooperating Non-Contracting Parties
CPC	Contracting Parties and Cooperating non-contracting parties
CPR	Cardio-Pulmonary Resuscitation
DAFF	Department of Agriculture, Forestry and Fisheries
DNEPP	National Directorate of Fisheries Economy and Policy
DNFP	National Directorate for Fisheries Law Enforcement
DNIIP	National Directorate of Fisheries Infrastructure and Industry
DNPA	National Directorate of Fisheries and Aquaculture
EEZ	Economic Exclusion Zone
ENS	Electronic Navigational Systems
EP	School of Fisheries
ETP	Endangered, Threatened and Protected
FAO	Food and Agriculture Organisation
FADEPA	Fund for Support for Development of Fisheries Industries
FCO	Fisheries Control Officer
FFP	Fisheries Development Fund
FMA	Fisheries Management Authorities
FOA	Fisheries Observer Agency
GMDSS	Global Marine Distress and Safety Systems
IBAR	Interafrican Bureau for Animal Resources
ICCAT	International Commission for the Conservation of Atlantic Tunas
IDPPE	National Institute of Development of Small Scale Fisheries
IIP	National Institute of Fisheries Research
INAIP	National Institute for Support of Fisheries Industries
INAQUA	National Institute of Aquaculture
INIP	National Institute of Fish Inspection
IOTC	Indian Ocean Tuna Commission
IPA	Artisanal Fisheries and Aquaculture Development Institute
IUU	Illegal, Unreported and Unregulated
KZN	KwaZulu Natal
MADRP	Ministry of Agriculture, Rural Development and Fisheries
MCS	Monitoring, Control and Surveillance
MdP	Ministry of Fisheries
MFMR	Ministry of Fisheries and Marine Resources
MIMAIP	Ministry of Sea, Inland Waters and Fisheries
MLRF	Marine Living Resource Fund

MLRA	Marine Living Resources Act
MMA	Ministry of Environment
MSC	Marine Stewardship Council
NDFP	National Directorate for Fisheries Law Enforcement
NOP	National Observer Programme
OROP	Offshore Resource Observer Programme
PFRS	Policy Framework and Reform Strategy for Fisheries and Aquaculture in Africa
REPMAR	Marine Fisheries Regulation
RFMOs	Regional Fisheries Management Organisations
ROP	Regional Observer Programme
SADSTIA	South African Deep Sea Trawling Industry Association
SADC	South African Development Community
SAIFA	South African Inshore Fishing Industry Association
SATA	South African Tuna Association
SEAFO	South East Atlantic Fisheries Organisation
SIOFA	South Indian Ocean Fisheries Agreement
SNAPA	National Stratified Random Sampling System
STCW95	Standards of Training, Certification and Watchkeeping for Seafarers
SWIOFC	Southwest Indian Ocean Fisheries Commission
TAC	Total Allowable Catch
TED	Turtle Exclusion Device
UNCLOS	United Nations Convention on the Law Of the Sea
UNDP	United Nations Development Programme guidelines
UNFSA	Conservation and Management of Straddling Fish Stocks and Highly Migratory Fish Stocks
VMS	Vessel Monitoring System
NatMIRC	National Marine Institute and Research Centre

Acknowledgments

The Director of AU-IBAR wishes to acknowledge the assistance and contributions from Southern African Countries, various individuals and organizations, including respective Regional Fisheries Organizations and Regional Economic Communities, other stakeholders and all those who facilitated the work of this consultancy. We also extend our thanks to all those who participated in the questionnaire survey. Special thanks go to the consultants who prepared the document and the team at IBAR for the editorial work.

This work was done under the project '**Strengthening Institutional Capacity to enhance governance of the fisheries sector in Africa**' Project number, DCI-FOOD 2013/331 -056, funded by the EU to whom we are grateful for the financial support.

1. Introduction

The Policy framework and reform strategy for fisheries and aquaculture (PFRS) placed emphasis on the conservation and sustainable use of fisheries resources as enhancing regional cooperation in the management of the fisheries sector. This policy area aimed at establishing national and regional governance and institutional arrangements that ensure increased contribution of sectors to socio-economic development of African Union member States. The Policy framework also underscored capacity building of African Union member states for effective participation in forums of Regional Fisheries management Organizations for increased benefits from High Seas fisheries. The 2014 Joint Ministerial Conference of agriculture, rural development, fisheries and aquaculture urged Member States to enhance cooperation for information sharing, data collection, analysis and dissemination at national and regional levels for fisheries management and aquaculture development.

The acquisition of information on fisheries is critical for their management. The main elements of a good fisheries management system would include an effective monitoring system, particularly any system that is sea-based. Sea-based monitoring systems are the “eyes” of the fishery. For example, sea-based monitoring can support scientific data collection (biological), identify types of fishing gear used, determine catch and effort independently and many other aspects (e.g. fishing positions, compliance issues) of the at-sea operation that help managers and scientists to better understand the fishery.

Monitoring systems for fisheries can also be split between those that aim to ensure compliance with regulations (such as Vessel Monitoring Systems or VMS) and those that aim only to collect information, such as sea-based observers (data collectors). Often the mandates of such systems overlap and independent observers are relied upon to monitor fishery performance and compliance with permit conditions. These mandates can apply both at national level (within a country’s Economic Fishing Zone or EEZ) and a regional level extending beyond areas of national jurisdiction (or ABNJ). At a regional level specific Regional Fisheries Management Organisations (RFMOs) may also require independent data collection by observers and member states of these organisations are obligated to carry both a national and international observer such as in the Commission for the Conservation of Antarctic Marine Living Resources (CCAMLR).

This work is intended to identify the status of observer programmes in Africa and to identify the gaps in the current national and regional programmes (if any). It aims to provide guidance on the development and/or improvement of the current observers programmes both at national and regional levels.

The work has a further secondary objective in that it aims to use observer programmes to strengthen the Monitoring, Control and Surveillance (MCS) systems in African fisheries in order to combat Illegal, Unreported and Unregulated (IUU) fishing activities. IUU can lead to loss of revenue and overfishing and in many cases destroying the livelihoods of fishing communities. National MCS systems that are both robust and adaptable and that are cohesive with regional and international MCS are essential towards stopping IUU fishing.

There are a number of global responses in action to IUU fishing, the most entrenched and overarching being the 1982 United Nations Convention on the Law of the Sea (UNCLOS), with 166 signatories worldwide. Amongst other things the Convention describes the rights and responsibilities of coastal states and fishing nations utilising the living resources of the sea. Pertaining to MCS and fisheries observers and in particular to nationals of foreign states fishing in the waters of coastal states, Article 62, section 4 says:

Nationals of other States fishing in the exclusive economic zone shall comply with the conservation measures and with the other terms and conditions established in the laws and regulations of the coastal State. These laws and regulations shall be consistent with this Convention and may relate, inter alia, to the following:

- a. licensing of fishermen, fishing vessels and equipment, including payment of fees and other forms of remuneration, which, in the case of developing coastal States, may consist of adequate compensation in the field of financing, equipment and technology relating to the fishing industry;
- b. determining the species which may be caught, and fixing quotas of catch, whether in relation to particular stocks or groups of stocks or catch per vessel over a period of time or to the catch by nationals of any State during a specified period;
- c. regulating seasons and areas of fishing, the types, sizes and amount of gear, and the types, sizes and number of fishing vessels that may be used;
- d. fixing the age and size of fish and other species that may be caught;
- e. specifying information required of fishing vessels, including catch and effort statistics and vessel position reports;
- f. requiring, under the authorization and control of the coastal State, the conduct of specified fisheries research programmes and regulating the conduct of such research, including the sampling of catches, disposition of samples and reporting of associated scientific data; and
- g. the placing of observers or trainees on board such vessels by the coastal State;
- h. the landing of all or any part of the catch by such vessels in the ports of the coastal State.

All the States in the southern and eastern regions of Africa are signatory to the UNCLOS but translation of those guidelines into national legislation is often inadequate or implementation and enforcement of national legislation is ineffective or non-existent.

At continental, there is the policy framework and reform strategy for fisheries and aquaculture in Africa that was endorsed by African Heads of States and Governments as a blue print for the development of the fisheries and aquaculture sector in Africa in June 2014. This continental fisheries policy document has a key policy area for the conservation and sustainable use of fisheries resources. Amongst others, this policy area therefore aims at ensuring that effective and sustainable regional Monitoring, Control and Surveillance (MCS) systems are operating in all regions of the continent.

Ensuring conservation and sustainable use requires an appropriate statutory/regulatory framework that is clearly understood, enforceable and supported by resource users and others. This can be achieved by:

- a. developing and strengthening the institutional framework for MCS for both marine and inland fisheries for combating IUU fishing. This should be underlined by evaluation of national and regional needs for MCS in AU MS and Regions
- b. improving regional cooperation and collaboration for sustainable fisheries management

- c. developing and sharing registers of authorized fishing and illegal fishing vessels
- d. enhancing capacities and establishing mechanisms including cost-effective and sustainable financial arrangements for efficient and effective regional cooperation in MCS and enforcement
- e. developing and agreeing on minimum terms and conditions of fisheries access and adopting a common harmonized and coordinated approach with regards to granting access to resources to third parties and national fleet within the region.

Although some African countries have acquired the capacity for electronic VMS, many still rely on the conventional methods of monitoring and observing fishing activities. A structured fisheries observer programme covering all licensed vessels enhanced by well-trained observers (data collectors) would not only complement existing MCS systems but would also increase accurate reporting of, for example, fishing positions, illegal fish transfer, daily catches and species composition, which are all vital for sustainable management of fishing practices.

Another major drawback in combating IUU fishing is the lack of a sophisticated and comprehensible national fishing vessel register, which is regularly updated and shared between member states of the African Union (AU). Vessel registers that include information such as the history and characteristics of the vessel are powerful tracking tools used to monitor illegal fishing activities. To be effective in tracking IUU fishing as well as collecting data for the management of fisheries, synergy between systems, coastal and island states and RFMOs is essential.

This report therefore focuses on describing the status of observers programmes specifically in four southern African states; Angola, Namibia, South Africa and Mozambique (Figure 1) and aims to demonstrate the need for synergy and a consolidated framework for observers and vessel registers to enhance the capacity for these states to collect fisheries data and help deter IUU fishing.

2. Objective

This report gives an overview of the current status of fisheries observer programmes in Southern African coastal States (Angola, Namibia, South Africa and Mozambique) and proposes a framework for sustainable regional fisheries observer programme

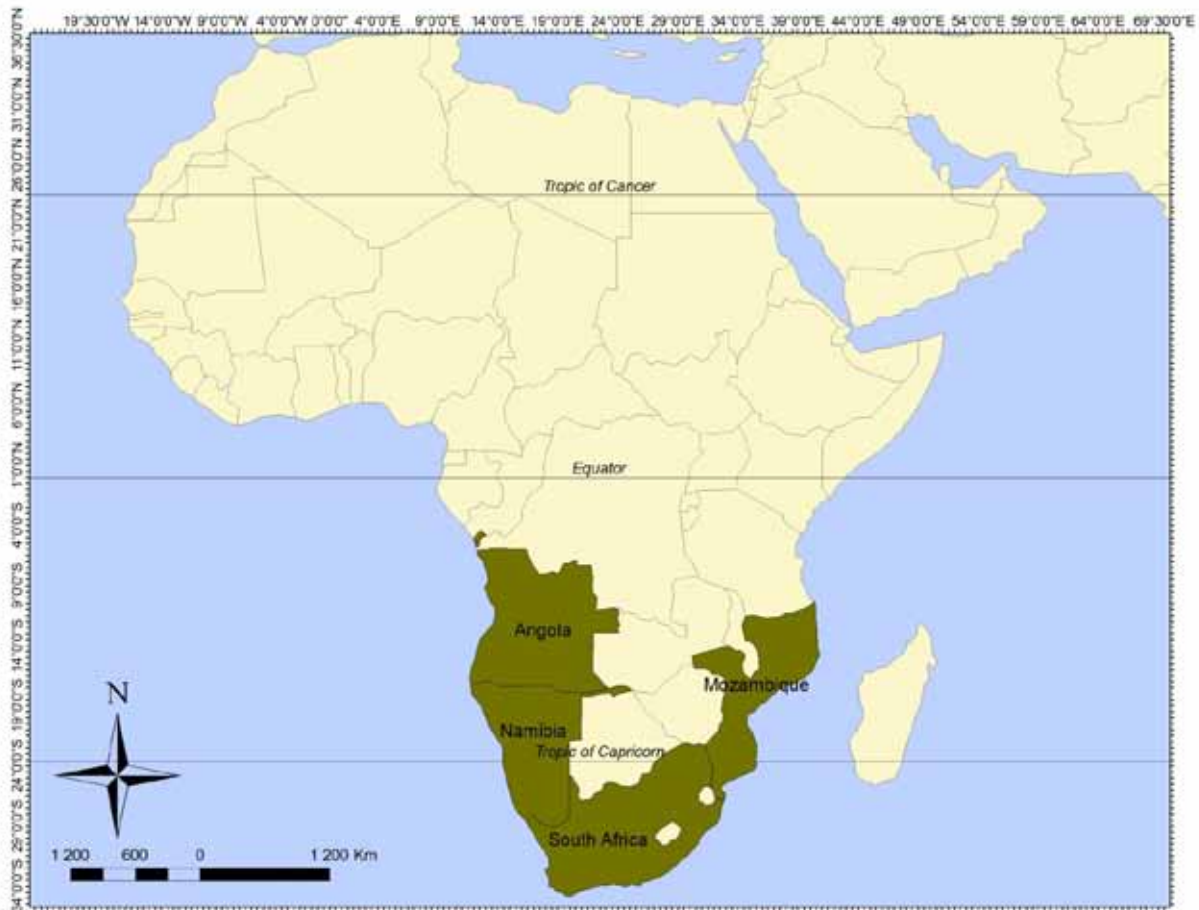


Figure 1. Location of the southern region countries of interest; South Africa, Namibia, Angola and Mozambique.

3. Methodology

This document is as a result of a “desktop based” research using online recourses and consultations through correspondences with specified member countries and relevant regional organisations. A questionnaire (translated into Portuguese) was sent via email to relevant fisheries authorities responsible for fisheries observer programmes. Most of the information has been received although in some instances no responses or data were received. Aspect of this work was also presented by the consultant to the participants of SADC IUU taskforce meeting in May 2016, Maputo and useful comments were also received.

3.1. Categorisation and Definitions of Observers

The review identifies fisheries observers into four categories Figure 2:

- sea-based observers (monitors or scientific observers);
- sea-based compliance officers (inspectors);
- land-based observers (monitors or scientific observers);
- land-based compliance officers (inspectors).

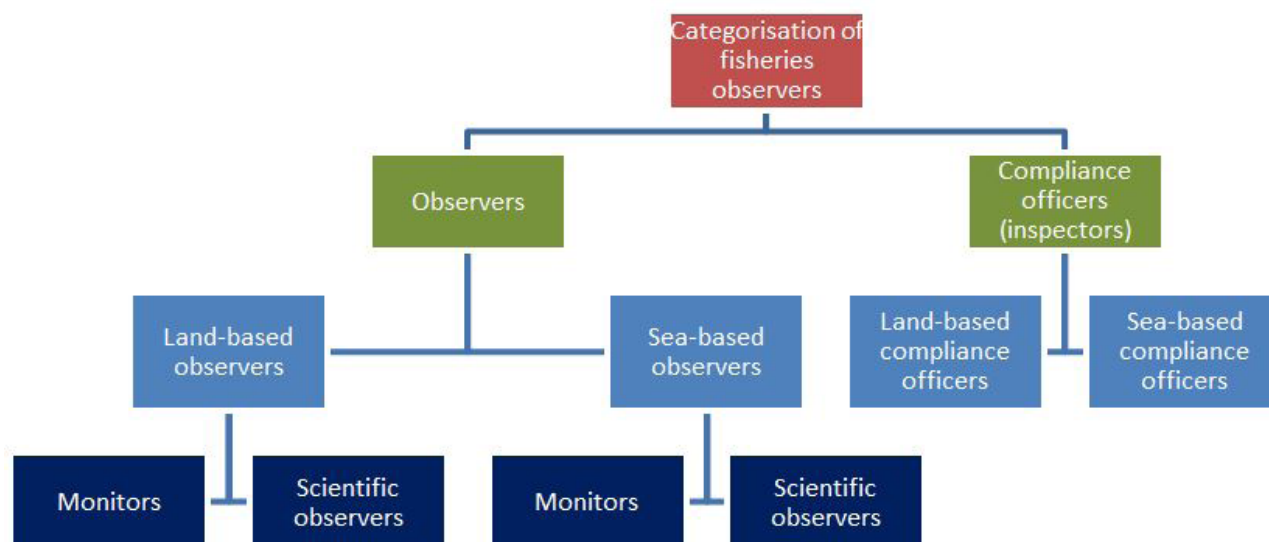


Figure 2. Organogram of the categorisation of observers (scientific and/or monitors) and compliance officers.

There are some fundamental differences in the legislative mandate in the appointment of compliance officers/inspectors and observers (monitors and scientific observers), and differences in the training, responsibilities and tasks onboard a vessel at sea or on land. This work therefore undertook review of the national and regional fisheries observer programmes in each of the countries in the southern region in terms of this categorisation (Figure 2).

Observers are further categorised into monitors and scientific observers. Both contribute to fisheries management, however the primary difference between them is that a monitors' main responsibility is to record catch and effort information. A scientific observer also records catch and effort information but in addition, conducts scientific biological sampling of the catch. For example, catch composition of species, length-frequency, weight, sex, maturity stage, stomach content and the collection of otoliths.

Sea-based observers

Sea-based observers are deployed onboard vessels to collect fisheries information at sea. Additional tasks often include monitoring and reporting on the environmental impacts of the fishery on other marine fauna such as seabird, marine mammals and, Endangered, Threatened and Protected (ETP) species. While an observer may report on compliance issues they have **no legal mandate to advise or enforce these**.

Sea-based compliance officers (inspectors)

Compliance officers operating at sea are appointed by the countries fisheries authorities and generally have a legal mandate to enforce the fisheries laws of the country. Sea-based compliance officers may be deployed onto vessels for the duration of the trip to monitor fishing activities directly and report on adherence to compliance measures stipulated in licence conditions issued by the State. Alternatively, compliance officers may operate independently from a patrol vessel and board and inspect fishing vessels at sea. At-sea inspection can include monitoring gear and catch onboard.

Inspectors are also referred to as Fishery Control Officers (FCOs) and are not therefore defined as observers herein. Inspectors have the authority to take legal action against a vessel acting in contravention to fishing methods, gear used or landed catches, in terms of its fishing permit conditions issued to it by its flag state. When justified, inspectors may have the power to arrest a vessel at sea and have it return to port.

Land-based observers

Land-based observers are generally stationed or may travel to ports or landing sites where either commercial or artisanal vessels off-load their catch. The observer's tasks would include recording the fishing methods used and the catch composition of the landed catch and collect biological information for all or some selected species. In some commercial ports the fisheries authorities may establish research laboratories to collect and record more specific scientific data from the catches landed in the port.

Land-based compliance officers (inspectors)

Compliance officers are stationed or travel to ports or landing sites where either commercial or artisanal vessels off-load their catch. Their tasks are primarily monitoring whether the gear and landed catches conform to the legislated requirements of the fisheries. Should they find that a vessel or its crew do not conform to any of these requirements they have the authority to prosecute offenders.

For the purposes of this review we focus only on "observers". We exclude as far as practical FCOs, and fisheries inspectors and only include these categories where functions might also be defined as data collectors.

3.2. Quantifying capacity needs

A well-structured institutional framework is the cornerstone for the development and implementation of a successful national scientific observer program. The organogram below depicts the levels of management required to co-ordinate and execute an effective, albeit generic, scientific sampling programme (Figure 3).

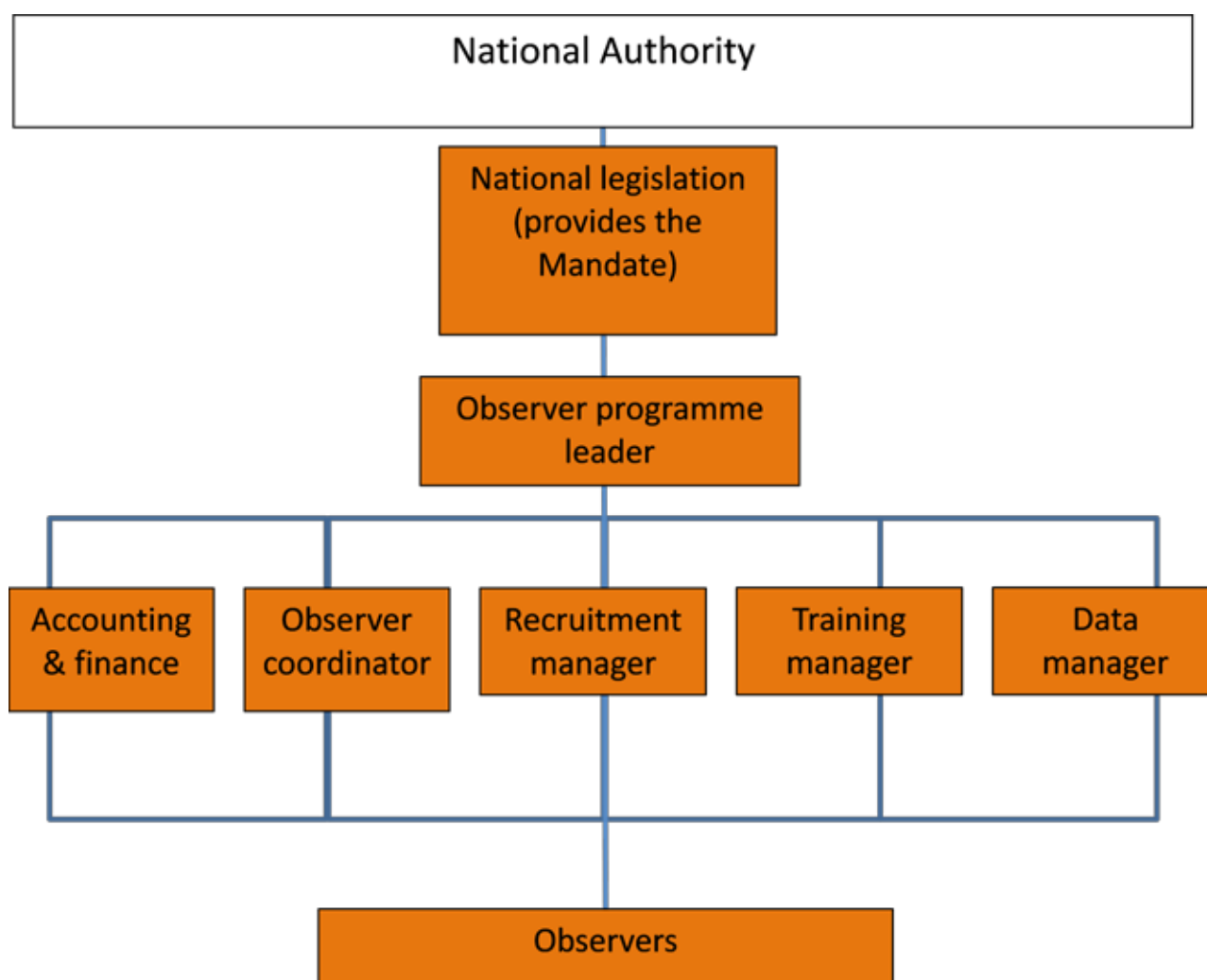


Figure 3: Organogram for a generic national observer programme.

It is recommended that there be a dedicated department/unit for the National Observer Programme (NOP). At each level of management structure shown above would be an individual person responsible for that sector of the NOP. In some cases where a country's fisheries operate on a small scale then a single individual could fulfil the requirements of more than one managerial position. Conversely, where fisheries are extensive there could then be more than one Observer Coordinator, for example or Manager for each of the fisheries sectors. The number of observers required is dependent on information needs, also on the number of vessels and types of fisheries for which data is required. In each of the Southern African countries subject to this review there is a difference in the nature, extent and value of fisheries which impacts the desired capacity needs for both management and observers in each specific country.

There are therefore no specific rules regarding national observer coverage levels. There are however requirements to satisfy RFMO membership. Three RFMOs in the Eastern and Southern African region have stipulated observer coverage requirements, they are:

1. IOTC – 5% of all domestic vessels fishing effort targeting tuna and tuna-like species;
2. CCAMLR – 100% of all registered vessels exploiting marine resources in the CCAMLR area of competence (includes Kerguelen and Crozet Islands); and
3. CCSBT – 10% of all fishing effort that targets southern bluefin tuna.

Note: For the Southwest Indian Ocean Fishery Commission (SWIOFC) no specific observer coverage levels have been specified.

The IOTC has emphasized the need to improve the catch and effort data for tuna caught domestically in order to better understand tuna dynamics and also to improve the total mortality estimates. IOTC coastal states data are somewhat lacking caused by the informal characteristics of their artisanal fisheries. Observations of artisanal fisheries can be problematic due to the variety and nature of vessels and gears employed, at-sea observations are, in most cases, not feasible and therefore higher sampling levels on shore at landing sites would be required. In absence of satisfactory catch history a country accumulates “poor performance”, which has implications for members’ quota allocations from RFMOs. In many instances, coastal states (or members of an RFMO) may have licensed foreign flag vessels in lieu of licensing their own vessels and which in most circumstances, have accumulated catch performance that accrues to the flag state rather than the licensing country. Had observers been deployed on these vessels, catch and effort data related to fishing inside a country’s waters (within the EEZ) could have been verified and claims for performance to the licensing authority justified.

Historical performance aside, coastal states currently licensing foreign flag vessels might deem that for these vessels at least, 100% observer coverage is needed. This would be the preferred option, in which case 10 licensed vessels would require at least 10 observers if they fished concurrently (the most likely scenario). If they fished irregularly then fewer observers would be needed. Coverage of domestic fleets should be higher than those stipulated by the RFMOs in order to obtain statistically significant sampling levels (5% would be the minimum). Once again it must be noted that coverage levels are dependent upon information needs. The monitoring of artisanal fisheries through the implementation of Frame and Catch Assessment Surveys (CAS), carried out annually or biannually, is the norm in most Eastern African coastal states. Frame Surveys provide a snapshot of the amount of fishing effort. Catch Assessment Surveys compliment frame surveys by measuring the catch of a set percentage of the fishery and then extrapolating the sample to the whole fishery to estimate total catch. If a country is seeking to formalise a fishery through licensing and developing a management plan then the sample size for the CAS would probably need to be increased, e.g. from 10% to 50% if statistical variability is to be minimised and more rigorous estimates of total catch calculated. If a fishery is seeking the certification of an eco-label for example, such as the Marine Stewardship Council (MSC), then sampling and observation of that fishery, be it artisanal or industrial, would then also need to be intensified in an attempt to obtain defensible catch and effort estimates (100% coverage would be the optimal level).

In order for an individual country to determine its capacity levels with respect to the number of observers required per fishery then it will need, for example, information on the following as a minimum:

1. total permitted or actual catch by fishery sector and species;
2. any input (effort) or output controls such as Total Allowable Catch (TAC);
3. actual number of vessels; or
4. the number of landing sites or fishing ports

Table 1 illustrates examples of fisheries and the number of observers that might be required to monitor them in order to achieve either minimum or maximum coverage. Each example would need to take into consideration the fundamental fishery characteristics as indicated in 1-4 above.

In addition to basic fishery information or fishery descriptors (listed above) many other factors might influence observer coverage levels and observer capacity needs. In particular, seasonal fisheries present logistical problems for observer deployments, as do large industrial fisheries that might operate for 365 days a year, 24 hours a day (probably requiring 2 observers on a vessel).

As a general rule, sea-going individuals (observers) are unlikely to be able to work for more than 50-75% of a year equating to between 180 to 280 days a year at sea. Land-based observers could be deployed in the field for longer periods as their job descriptions would equate more to a typical employee with normal leave and working conditions.

Armed with the above information then, any given country or fishery has the ability to calculate observer capacity if the fishing effort levels or catches are known. The desired coverage for each fishery is however still largely dictated by management objectives and provided that observed maximum sea day capability is not exceeded, once the number of observers is decided then, by working backwards, the number of observer managers can be determined.

The methodology used to determine the capacity needs of individual countries for this review will not calculate the number of observers required for each fishery in those countries. Capacity evaluations will first look at the current monitoring programmes active and the respective coverage of each fishery and then at institutional arrangements within each country. The capacity needs of any country therefore should not be randomly selected but based on the specific number and types of fisheries within that country, the management objectives of those fisheries, the institutional frameworks already in place (if any), and the existing commitments that those countries might have to RFMOs.

Table 1: Examples of fisheries and the number of observers

Table shows levels required to monitor either a minimum (5%) or maximum (100%) coverage. Examples are derived from fisheries descriptors, 1. Total catch previous year, 2. Total allowable catch, 3. Number of vessels and 4. Number of landing sites.

Fishery	Observer type	Total catch previous year	Observer average weight sampled per day	Observer average work days per year	Number of observers needed to achieve 5% coverage	Number of observers needed to achieve 20% coverage	Number of observers needed to achieve 30% coverage	Number of observers needed to achieve 100% coverage		
Small-scale commercial	Land-based	1000 tons	100 kg	280	2	7	18	36		
Fishery	Observer type	Total allowable catch current year	Observer average weight sampled per day	Observer average work days per year	Number of observers needed to achieve 5% coverage	Number of observers needed to achieve 20% coverage	Number of observers needed to achieve 50% coverage	Number of observers needed to achieve 100% coverage		
Semi-Industrial	Land-based	5000 tons	200 kg	280	4	18	45	89		
Fishery	Observer type	Number of vessels	Average trip duration	Number of trips per year	Total days at sea	On-board observer average sea days per year	Number of observers needed to achieve 5% coverage	Number of observers needed to achieve 20% coverage	Number of observers needed to achieve 50% coverage	Number of observers needed to achieve 100% coverage
Industrial Tuna	At-sea	50	90 days	4	18000	180 - 200	5	20 - 18	50 - 45	100 - 90
Fishery	Observer type	Number of landing sites	Average number of days landings occur	Total days fish landed per year	On-shore manager/observer average work days per year	Number of sites per manager	Number of observers per site	Number of managers/observers needed to achieve:	Managers	Observers
Artisanal	Land-based	30	360	10800	280	3	2	5% coverage	2	12
								10% coverage	4	24
								50% coverage	19	114
								100% coverage	39	234

4. Review of the national fisheries observer programmes for South Africa, Namibia, Angola and Mozambique

4.1. South Africa

South Africa has a coastline that spans two ecosystems over a distance of 3 623 km, extending from the Orange River in the west on the border with Namibia, to Ponta do Ouro in the east on the Mozambique border (Figure 4). The western coastal shelf has highly productive commercial fisheries similar to other upwelling ecosystems around the world, while the east coast is considerably less productive but has high species diversity, including both endemic and Indo-Pacific species.

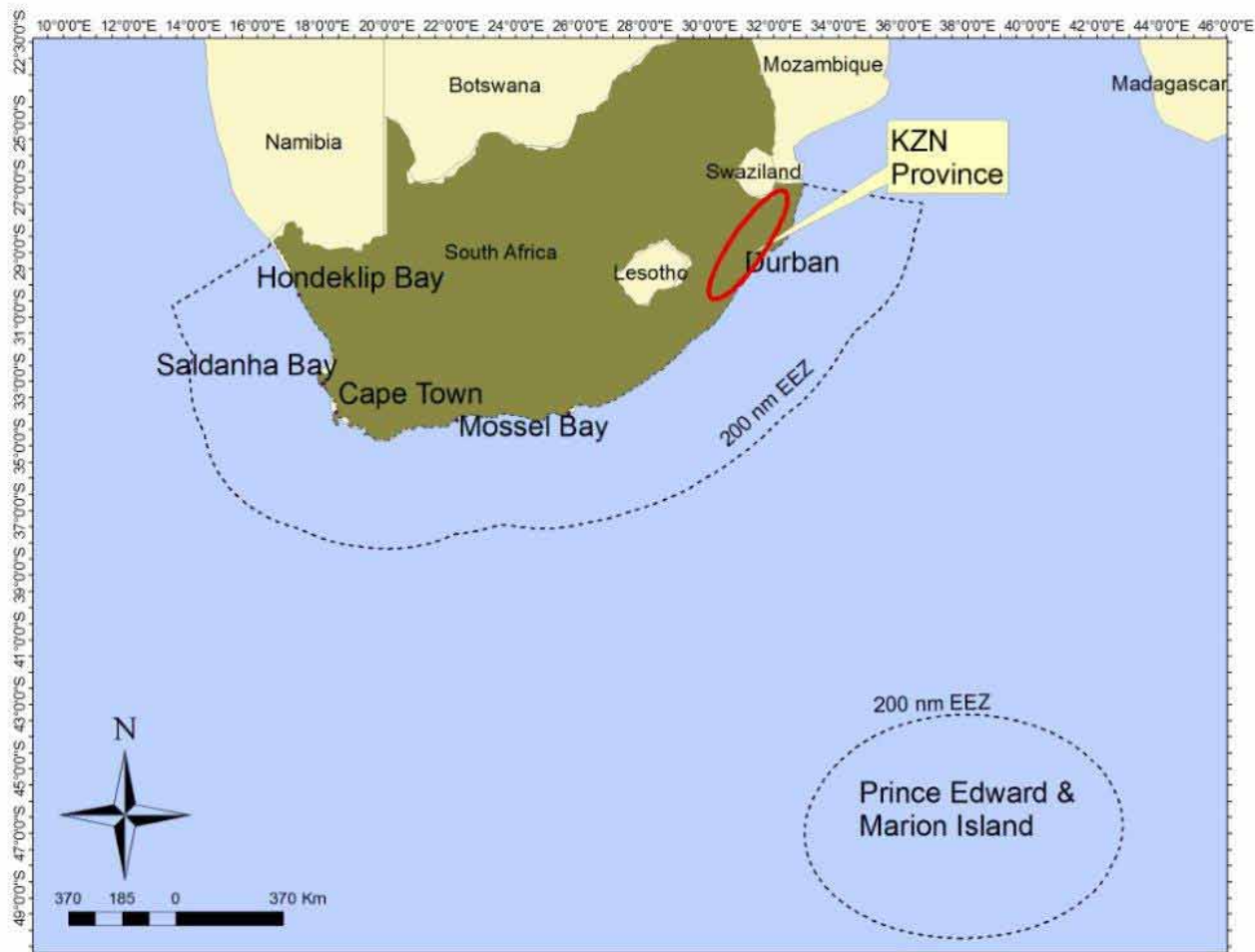


Figure 4: Map showing the EEZ around South Africa and Prince Edward & Marion Island. The locations of the significant ports are shown.

There are currently 18 different commercial fisheries sectors active in South African waters (Table 2). In addition to commercial sectors, recreational fishing occurs along the coastline comprising shore angling and small, open boats generally less than 10 m in length. The commercial and recreational fisheries are reported to catch over 250 marine species, although fewer than 5 % of these are actively targeted by commercial fisheries, which comprise 90 % of the total landed catch.

4.1.1. Legislation and legal frameworks

South Africa's commercial fisheries are regulated and monitored by the Department of Agriculture, Forestry and Fisheries (DAFF) [previously managed under the Department of Environmental Affairs and Tourism: Directorate: Marine and Coastal Management]. The governance of all fisheries in South

Africa, as well as the processing, sale in and trade of almost all marine resources, are regulated under the Marine Living Resources Act, 1998 (No. 18 of 1998) (MLRA).

Observers are specified in the by MLRA 18 of 1998 in Chapter 6 - Law enforcement. In terms of the MLRA the legal mandate for observers and compliance officers are clearly specified (Appendix 2), underpinning their conditions, powers and responsibilities. The Fisheries Branch of DAFF is responsible for managing the use of marine and coastal resources within the Exclusive Economic Zone (EEZ) of South Africa (Figure 4). In executing this responsibility, specific permits and binding conditions are issued to each fishery. In accordance with international fisheries agreements, to which the South African government is a party to, it is also required that a legal permit or Authorisation to Fish (ATF) is issued to each of its flagged vessels that wish to fish on the High Seas (outside its EEZ). These Areas Beyond National Jurisdiction (ABNJ) are not a national responsibility and would mostly fall under the mandate of Regional Fisheries Management Organisations (RFMOs), whose objectives are the management and conservation of shared fish stocks within their designated region.

4.1.2. National institutional arrangements

South Africa is probably the leading country in Africa with regard to the implementation of a national scientific observer programme. The institutional arrangements that form the basis of the South African observer programmes are shown in the organogram below (Figure 5).

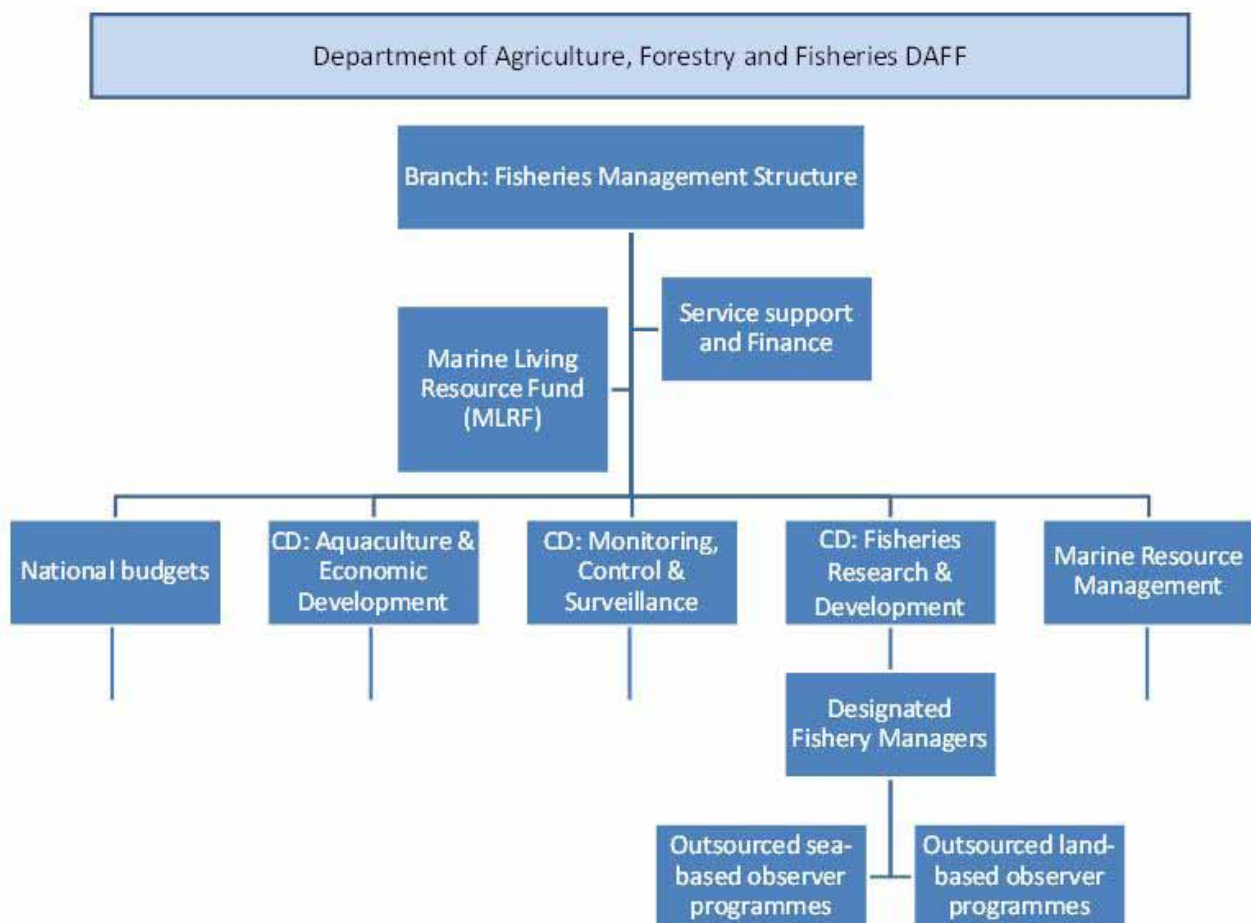


Figure 5: Institutional arrangements for the Fisheries Management Branch of DAFF and the companies responsible for the land and sea-based observer programmes.

The Marine Living Resources Fund (MLRF) finances in part the operations of the Fisheries Management Branch of DAFF (Figure 5). The Fisheries Branch is responsible for managing the development, management, monitoring and sustainable uses of marine living resources, to protect the integrity and quality of the marine ecosystem, and to ensure the growth of the aquaculture sector. The MLRF covers the operational costs of four Chief Directorates (CD), as well as the operational and administrative costs of a number of support components, namely:

- Aquaculture and Economic Development, which promotes the growth of the aquaculture sector by providing public support and an integrated platform for the management of aquaculture. The Chief Directorate also facilitates the development of alternative livelihoods for coastal communities and the management of the 12 proclaimed fishing harbours.
- Fisheries Research and Development which promotes the sustainable development of fisheries resources and ecosystems by conducting and supporting appropriate research.
- Marine Resource Management which fosters the sustainable use and the equitable and orderly access to marine living resources through improved management and regulation.
- Monitoring, Control and Surveillance which ensures the protection and promotion of sustainable use of marine living resources by intensifying enforcement and compliance efforts.
- The MLRF also covers the operational and administrative costs of the Chief Director: Fisheries Operations Support, the Chief Directorate Financial Management for the MLRF and the support components of Communications, Human Resources, Information Technology, Legal Services, International Relations, Stakeholder Relations, and Customer Services.

4.1.2.1. South African observer programmes

4.1.2.2. National Sea-based observers programme (scientific observers)

The DAFF sea-based scientific observer programme (also referred to as the Offshore Resource Observer Programme or OROP) was initiated in 2002 and ran, albeit with interruptions, until it ended in 2011. Capricorn Marine Environmental (CapMarine) (Pty) Ltd and Anchor Environmental Consultants were outsourced by DAFF to manage OROP and achieved between 15 - 20 % observer coverage across all of South Africa's offshore fishing sectors. In 2014, DAFF requested applications from service providers to reinstate OROP, as well as to establish a new land-based programme. Although this work has not yet been awarded, the framework and designated number of observer days per sector per year for the land and sea-based observer programmes has been prepared (Table 2).

In addition to the government funded observer programme (i.e. OROP) there are a number of other observer programmes that are either industry funded or voluntary. These include:

4.1.2.3. South African Deep Sea Industry Association (SADSTIA) observer programme.

CapMarine has an active observer programme with South African Deep Sea Trawling Industry Association (SADSTIA). This programme was initiated by the industry primarily as OROP was discontinued and an active national observer programme is essential for maintaining the Marine Stewardship Council (MSC) certification for trawl-caught hake.

SADSTIA observers are deployed on demersal trawl vessels to collect scientific information on hake, bycatch and seabird-warp interactions. The duration of a SADSTIA trip is either one week on wetfish vessels or a month on freezer vessels. The programme requirements consist of 90 sea days per month, which is equivalent to 10% of the total sea days for the trawl fishery.

4.1.2.4. The tuna longline (local and foreign flagged) observer programme

For South African flagged vessels, CapMarine is contacted by vessel owners or permit holders to meet the requirements of the IOTC Regional Observer Programme. On both the local and foreign tuna vessels observers are required to collect scientific data for tuna and tuna like species, monitor the adherence to permit conditions as well as Interactions with the Endangered, Threatened and Protected (ETP) species. Observers are also expected to report on suspected Illegal, Unreported and Unregulated (IUU) vessels.

The foreign flagged tuna longline observer programme is run collaboratively with the South African Tuna Association (SATA) and in close collaboration with DAFF and Birdlife SA. These vessels are required to carry an observer for 100% of their fishing effort. CapMarine has been appointed by SATA to monitor all foreign flagged vessels.

4.1.2.5. West coast rock lobster

CapMarine is responsible for the industry-funded sea-based West Coast rock lobster research programme. On an annual basis the South African Inshore Fishing Industry Association (SAIFIA) requests for observers to monitor the research surveys on the West Coast of South African near Dassen Island (Area 7). A total of seven days per month for four months is required per year.

4.1.2.6. Midwater trawl (horse mackerel)

The midwater trawl fishery targets horse mackerel. There are currently 15 rights holders within this fishing sector, however the majority of effort is undertaken by a single dedicated vessel, which operates all year round on the South Coast. This dedicated vessel has 100% observer coverage, which both DAFF and CapMarine provide scientific observers.

4.1.2.7. Seabird observer programme

BirdLife South Africa (SA) is a registered non-profit and public benefit environmental organization with over 6 000 members throughout South Africa. The Albatross Task Force (ATF) forms part of the seabird conservation branch of Birdlife SA and runs a sea-based scientific observer programme specifically to monitor impacts on seabirds. The observers are deployed on both hake trawl and hake longline vessels to collect information on seabird species abundance and interactions with fishing operations (Table 2).

4.1.3. Regional observer programmes

South Africa is a full member of the RFMOs and the International Commissions listed below:

- Commission for the Conservation of Antarctic Marine Living Resources (CCAMLR);
- International Commission for the Conservation of Atlantic Tunas (ICCAT);
- South East Atlantic Fisheries Organisation (SEAFO);
- Benguela Current Commission (BCC);
- Indian Ocean Tuna Commission (IOTC)
- Commission for the Conservation of Southern Bluefin Tuna (CCSBT), and
- Southwest Indian Ocean Fisheries Commission (SWIOFC).

All of these RFMOs have Conservation or Management Measures (CMMs) in place requiring vessels to accommodate scientific fisheries observers. South Africa is meeting the RFMO commitments and obligations (see Section 6 for details on RFMO commitments with respect to observer coverage).

South Africa is also a member of the Southern African Development Community (SADC). SADC (HQ in Gaborone, Botswana) is responsible for a regional fisheries monitoring, control and surveillance (MCS) programme (to be implemented by the Regional MCS Coordination Centre to be based in Maputo, Mozambique). There are 15 SADC member countries and some of them have national fisheries observer programmes. The SADC fisheries policy does not explicitly state observer's roles and responsibilities or whether they are required on fishing vessels. However, part of the regional fisheries observer programme, which is indicated as a deliverable under the Regional MCS programme, is to harmonise national observer standards, observers and observer reporting

4.1.3.1. Convention on the Conservation of Antarctic Marine Living Resources

International observers are deployed, on request from members, onboard their vessels fishing within the CCAMLR Convention Area in accordance in terms of the CCAMLR Scheme of International Scientific Observation. In addition South African vessels fishing within the South African EEZ around Prince Edward and Marion Islands are also required to accommodate two observers for 100% of all fishing activities in this area.

CCAMLR trips are approximately three to four months long. The observer tasks are clearly outlined in the CCAMLR Conservation Measures (CM41-01 ANNEXs A, B, & C), and CCAMLR observer manual. These include inter alia:

- monitoring the gear specifications and deployment;
- observing hauling operations to check by-catch and interactions with other marine fauna;
- sampling a percentage of the catch;
- recording conversion factors of product from green to processed weight; and
- recording all data of tagged fish released and sampling all recaptured tagged fish.

All data are captured on prescribed CCAMLR log-sheets and a comprehensive cruise report has to be submitted to the CCAMLR secretariat at the completion of each trip.

4.1.3.2. Indian Ocean Tuna Commission IOTC observer programme

In terms of the IOTC Resolution 12-05 superseded by Resolution 14/06 On establishing a programme for transshipment by large-scale fishing vessels, CapMarine has been working in consortium with Marine Resources Assessment Group MRAG (UK) Ltd to recruit, train and deploy observers on all transshipment vessels operating in the Indian Ocean region. These observers follow a strict sampling protocol to monitor transshipment of all products from tuna longline vessels fishing in the Indian Ocean to Carrier vessels. Monitoring involves tallying fish transfers from fishing vessel to the carrier vessels as well as many other checks such as vessel safety, declarations and vessel monitoring systems. The long-term objective of the observer programme is to combat IUU fishing activities in the IOTC area.

4.1.3.3. International Commission for the Conservation of Atlantic Tunas (ICCAT) Regional Observer Programme

In accordance with the Recommendation by ICCAT on a Programme for Transshipment (Rec. [12-06]) that requires that all transshipments of ICCAT species take place in port, unless they are monitored under the ICCAT Regional Observer Programme for transshipment (ROP). The ROP has been implemented since 2007 in a consortium between CapMarine and MRAG, which carries out observer recruitment and training, equipment purchases and observer deployments under the

supervision of the ICCAT Secretariat.

4.1.4. Land-based monitoring programmes

DAFF has in place, frameworks for fisheries observer programmes that monitor the entire South African coastline from the Namibian border on the West Coast to the Mozambique border on the East Coast (Figure 4). Monitors record the daily catch and effort data information, number of fishers; catchment area; number of vessels fishing; mode/method used; and fish caught fish s (i.e. type, numbers, size). The following monitoring programmes are active in South Africa:

4.1.4.1. DAFF Land-based monitoring for tuna and swordfish.

Port sampling for tuna, swordfish and related species began in 1973 in the IOTC region. The collection of albacore length frequency data through port sampling of Pole and Line vessels has been undertaken by employees of the DAFF since 2011. The skippers are encouraged to collect yellowfin tuna length frequency measurements onboard Pole and Line vessels prior to dressing the catch.

4.1.4.2. Land-based monitoring programme

JAYMAT Environmental Solutions cc is a private environmental consultancy responsible for the DAFF funded land-based monitoring programme for the small scale fisheries landings in three provinces: Eastern Cape, Western Cape and Northern Cape (excluding KwaZulu Natal, KZN). A total of 169 monitors have been employed to observe and record catch data for five fishing sectors along the coastline. These include the oyster, linefish, abalone, brown and white mussel and West and East coast rock lobster fisheries. The monitors also record the bait landings and total netfish landings. JAYMAT is responsible for 79 monitoring stations and covers over 3400 days of monitoring per year. There is no compliance data being collected and data is purely research with catch, effort and basic biological data being collected. The field data forms are then captured electronically and submitted to DAFF.

4.1.4.3. Monitoring of small scale fisheries in KZN

KwaZulu-Natal (KZN) Wildlife - Ezemvelo is a governmental organisation that is contracted by DAFF to monitor the KZN Province on the East Coast of South Africa, approximately 660 km (Figure 4). One of their programmes involves the land-based monitoring of small scale fisheries along the KZN coast. These observers collect and record catch data and do not have a compliance role (except for checking fishing permits). There are 83 monitors working 21165 days per year monitoring the entire KZN coast for all species including oysters, mussel, line fish and red bait.

4.1.5. Capacity needs

Currently South Africa has active sea-based observer programmes for monitoring the tuna longline (foreign and domestic), hake trawl, hake longline, toothfish longline, midwater trawl and West Coast rock lobster fishing sectors. There are also active land-based monitoring programmes for the tuna longline (foreign and domestic), prawn trawl, West Coast rock lobster, linefish, netfish, oyster and white mussel fishery (Table 2). Approximately 61% of South African fishing sectors are being monitored either by sea-based scientific observers or by land-based monitors. However, not all these sectors are being monitored at the level that was intended and there are some sectors that have very low observer coverage.

Even though there is a framework for a National Observer Programme (NOP), there is still a significant amount of fishing activity not being monitored by observers. This is primarily due to the lack of funding for NOPs. Previously, DAFF was given funding to outsource this work (to service providers) but this hasn't been the case in recent years. Thus, there is a need for the Government to prioritise the re-establishment of NOPs and either reinstate agreements with the service providers or develop an "in-house" observer monitoring department. The service providers have the capacity and institutional structures to recruit, train and deploy observers, however the Government would have to develop the infrastructure and the human capacity (at all levels from management to observer) to carry out this work (refer to section 3.2. Quantifying capacity needs).

With respect to the RFMOs, South Africa is meeting the observer coverage targets. For IOTC and ICCAT 5% of the tuna longline (domestic) fishery is being monitored. For CCAMLR 100% of the South African vessels are being monitored.

Table 2: Summary of the fishing sectors, observer coverage and institution responsible for the South African observer programmes.

Fishery Sector	Effort Indicator (# of vessels/ fisherman/ TAC)	Active sea-based observer program (Y/N)	Active land-based monitor program (Y/N)	Current sea-based observer coverage (% , no. of observer days)	Current land-based monitor coverage (% , no. of monitor days)	Framework and designated observer coverage (% or # of observer days p yr)	Institution/ company responsible
Tuna longline (national)	16 vessels	Y	Y	5%	?	5%	SA flagged reg. in IOTC/ICCAT. Sea-based observers supplied by CapMarine. Land-based observers supplied by DAFF
Tuna longline (foreign flag)	4	Y	Y	100%	?	100%	Non-SA flag IOTC/ICCAT member. Sea-based observers supplied by CapMarine. Land-based observers supplied by DAFF
Tuna pole	110 vessels	N/A	N			72 monitor days	Inactive DAFF land-based monitoring programme
Longline (toothfish)	2 vessels	Y	N/A	100%		100%	Observers funded by CCAMLR supplied by CapMarine
Bottom longline (shark)	6 vessels	N	N/A			72 sea days	Inactive DAFF sea-based observer programme

Fishery Sector	Effort Indicator (# of vessels/fisherman/TAC)	Active sea-based observer program (Y/N)	Active land-based monitor program (Y/N)	Current sea-based observer coverage (% , no. of observer days)	Current land-based monitor coverage (% , no. of monitor days)	Framework and designated observer coverage (% or # of observer days p yr)	Institution/ company responsible
Bottom longline (hake)	64 vessels	Y	N/A	5%		5%	Observers funded by industry (SAHLLA) supplied by CapMarine and Birdlife SA
		N	N/A			400 sea days	Inactive DAFF sea-based observer programme
Bottom trawl (hake & sole)	76 vessels	Y	8N/A	10%		20%	Observers funded by industry (SADSTIA) and supplied by CapMarine and Birdlife SA
		N	N/A			280 sea days	Inactive DAFF sea-based observer programme
Bottom trawl (prawn)	5 vessels		Y		5%		Monitors funded by DAFF supplied by KZN Wildlife
		N				50 sea days	Inactive DAFF sea-based observer programme
Midwater trawl (horse mackerel)	1 vessel	Y	N/A	100%			Sea-based observers supplied by DAFF. Note, vessel currently not operating in SA
Purse seine (small pelagics)	101 vessels	N				750 sea days	Inactive DAFF sea-based observer programme
			N			259 monitor days	Inactive DAFF land-based monitoring programme
Trap (West Coast rock lobster)	105 vessels		Y	10%		259 monitor days	Land-based monitors funded by DAFF supplied by JAYMAT
		Y		<1%		28 days	Funded by industry (SAIFIA). Sea-based observers supplied by CapMarine
		N				160 sea days	

Fishery Sector	Effort Indicator (# of vessels/fisherman/TAC)	Active sea-based observer program (Y/N)	Active land-based monitor program (Y/N)	Current sea-based observer coverage (% , no. of observer days)	Current land-based monitor coverage (% , no. of monitor days)	Framework and designated observer coverage (% or # of observer days p yr)	Institution/company responsible
Trap (South Coast rock lobster)		N				60 sea days	
Squid (jig)	12 vessels		N			72 monitor days	No framework in place
Traditional linefish	138 vessels	N	N				Monitors funded by DAFF supplied by KZN Wildlife & Jaymat
Netfish	450 vessels	N/A	Y			2397 days	Monitors funded by DAFF supplied by KZN Wildlife & Jaymat
Oyster	634 tonnes	N/A	Y			447 days	Monitors funded by DAFF supplied by KZN Wildlife & Jaymat
W h i t e mussel (small invertebrates)	142 fishers	N/A	Y			72 days	Monitors funded by DAFF supplied by KZN Wildlife & Jaymat
T r a p (O c t o p u s) exploratory	7 fishers per day	N/A	Y			72 days	Experimental fishery
Abalone	?	N	N/A			1%	Inactive DAFF sea-based observer programme
R e d e y e exploratory	300 right holders	N	N			72 days	Experimental fishery
W h e l k and crab exploratory	?	N	N/A			1%	Experimental fishery

4.2. Namibia

Namibia has one of the most productive fishing grounds in the world, due primarily to the presence of the Benguela current and the predominant up-welling system. Since Independence in 1990, the fishing industry has grown to become one of the pillars of the Namibian economy. Namibia issues commercial rights for about 20 different fish species, comprising demersal (i.e. bottom or near-bottom dwelling) fish, small pelagic (upper water column) fish, large migratory fish and crustaceans. Commercial fishing is prohibited in water shallower than the 200 m bathymetric contour. Catches are landed mainly at two major ports: Walvis Bay and Luderitz (Figure 6).

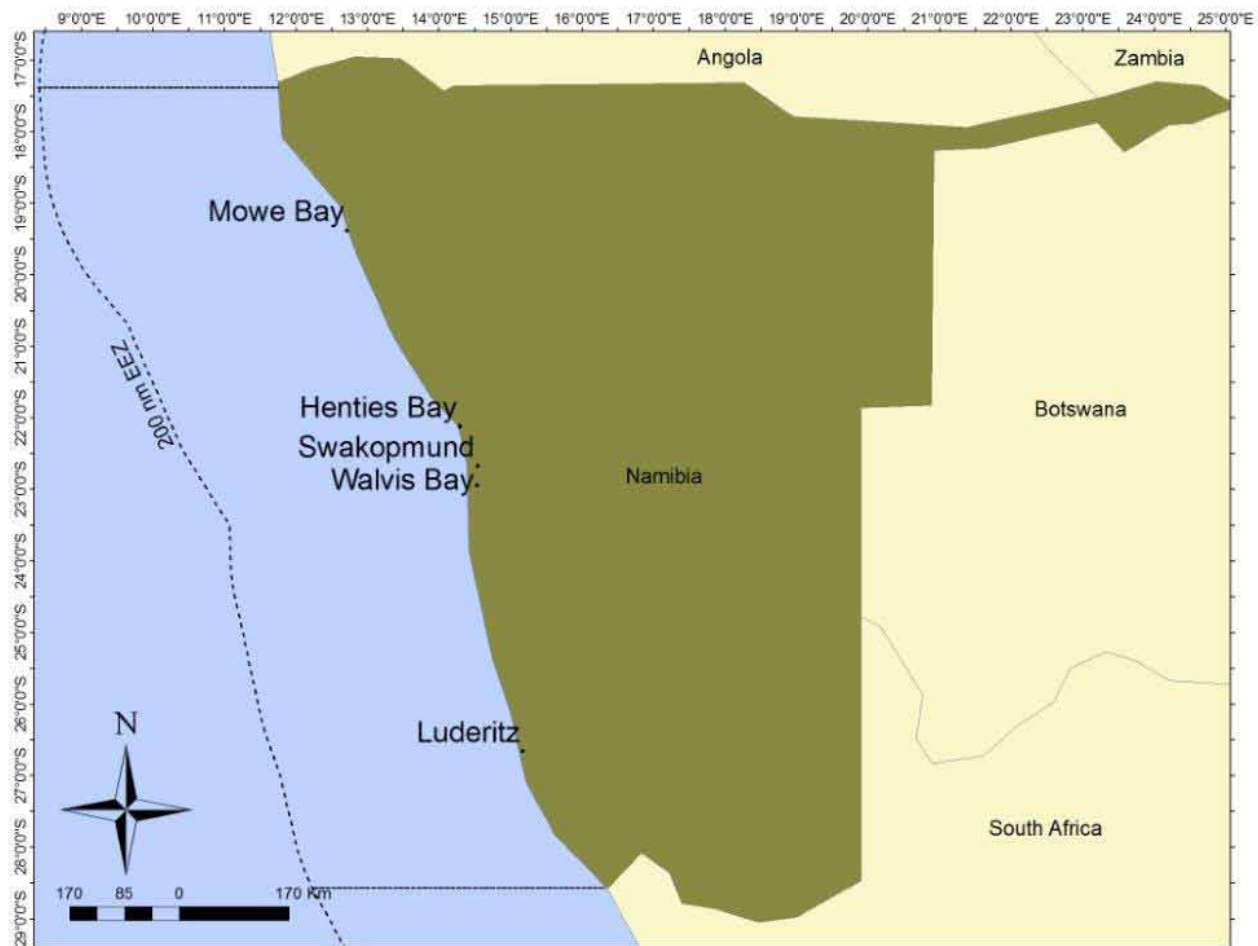


Figure 6: Map of Namibia showing the EEZ and the 200m bathymetric contour. Note, Namibia is prohibited from fishing in depths less than 200m. The location of the main ports are also shown.

4.2.1. Legislation and legal frameworks

Under the Namibian national legislation, the Marine Resources Act No 27, 2000 identifies fisheries observers (Appendix 3). Namibia's key fisheries institution is the Ministry of Fisheries and Marine Resources (MFMR). Established in 1991 and located in Windhoek, it has a very clear fisheries management focus.

4.2.2. National institutional arrangements

The MFMR consists of three Directorates and each directorate comprises of divisions, subdivisions and/or units (Figure 7):

- Directorate of Resource Management, of which the National Marine Institute and Research Centre (NatMIRC) is a part of, is responsible for scientific research and advice;

- Directorate of Operations, which incorporates the Fisheries Observer Agency (FOA), is responsible for monitoring, control and surveillance, and also for administration and a range of other functions; and
- Directorate of Policy Planning and Economics serves to strengthen the policy and planning functions of the Ministry.

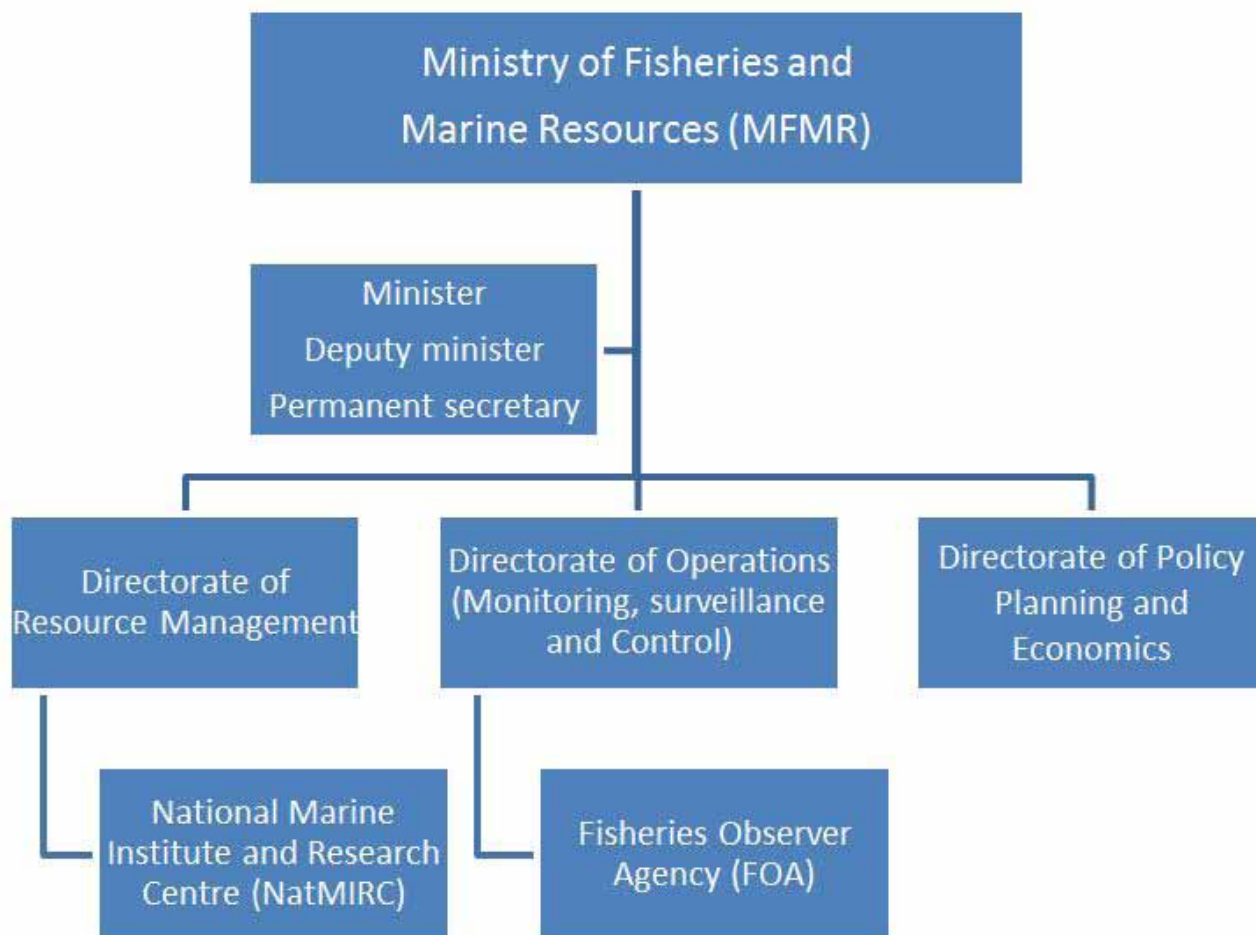


Figure 7: Institutional arrangements for the Ministry of Fisheries and Marine Resources (MFMR).

4.2.3. Namibian observer programmes

4.2.3.1. Sea-based observers programmes (monitors and scientific observers)

The Namibian observer programme, which forms part of the MFMR Monitoring, Control and Surveillance (MCS) programme, was established in 1991. The programme is based in both Walvis Bay and Lüderitz. The MCS programme has two components vis-à-vis the land-based inspectorate, responsible for control and surveillance, and the observer programme acting as the monitoring arm.

After signing a memorandum of understanding with MFMR, the Fisheries Observer Agency (FOA) was established 2002. The Objectives of the FOA as stated in the Governance Agreement are to:

- undertake independent observations of the harvesting of marine biological resources in and outside Namibian waters to provide catch, by-catch, and biological data necessary to support in-season monitoring and stock assessment, as required by the Ministry;
- complement the Ministry's monitoring, control, surveillance and scientific activities through the provision of prompt and accurate information;
- provide information necessary to support management of marine mammals and other protected species; and

- provide information necessary to support other specified science and management programs.

The FOA's objective is to compliment the Government's monitoring, control and surveillance and data collection activities. The FOA places fisheries observers onboard commercial fishing vessels to monitor compliance to legislation and collect scientific data (on behalf of the MFMR; Fisheries Research Unit), which is required by the scientists for stock assessment purposes. The goal is to cover 100% of all fishing activities. The FOA deploys around 200 observers on board all fishing vessels and the observer coverage per fishery is shown in Table 3.

The FOA has no law enforcement powers; thus its mandate is restricted to – Observe, Record, and Report. All non-compliance issues recorded in Namibian waters are reported to the Directorate of Operations in the MFMR for further action while all scientific data collected are forwarded to the Directorate of Resource Management within the MFMR.

Data collected by FOA observers include the following;

- length frequency;
- sex determination of commercial species;
- sexual maturity;
- stomach contents
- collection of otoliths for age studies;
- catch and bycatch composition by weight and percentage and;
- by-catch identification.
- fishing effort (no of hooks/traps/duration of trawl etc.)
- verifications of fishing log books
- information on by-catch mitigation devices (i.e. the use of bird scaring lines)

Namibian fisheries observers are meant to join swordfish, large pelagic longline, and shark vessels fishing in international waters and work together with other observers from different countries. Framework is in place for these deployments in international waters and in areas governed by the Convention of Antarctic Marine Living Resources (CCAMLR) and the International Commission for the Conservation of Atlantic Tunas (ICCAT), however it should be noted that FOA observers are currently not deployed on these vessels.

4.2.3.2. Land-based monitoring programmes (scientific observers)

Port sampling is an ongoing programme that was introduced in 1995, but it stopped in 1999. This programme was re-started in 2006 by the National Marine Institute and Research Centre (NatMirc), and has been running since. The data is being collected at Walvis Bay and Luderitz. Port sampling involves collection of biological data for the fishery at dockside or at processing facilities. Samples are collected from fishing companies and brought to NatMirc's laboratory. The Port sampling programme is important because there are types of fishery-dependant data that cannot be collected by onboard observers due to the unavailability of specific equipment.

The fishing companies collect about three bins of whole fish per week. The skipper fills in the catch information that gives details about the samples; vessel name, depth, position and catch data. The sampling is then carried out on land by NatMirc and the following data is collected; species identification, length measurements, sex determination, maturity stage, weight, otoliths are collected and stomach contents are recorded.

4.2.4. RFMO commitments

Namibia is a full member of the RFMOs and the International Commissions listed below;

- Commission for the Conservation of Antarctic Marine Living Resources (CCAMLR);
- International Commission for the Conservation of Atlantic Tunas (ICCAT);
- South East Atlantic Fisheries Organisation (SEAFO);
- Benguela Current Commission (BCC);

Namibia is not currently fully meeting the RFMO commitments and obligations (see Section 6 for details on RFMO commitments with respect to observer coverage). Namibia is also a member of the South African Development Community (SADC). However the SADC fisheries policy does not explicitly state observer's roles and responsibilities or whether they are required on fishing vessels.

4.2.5. Capacity needs

Namibia monitors 80% of its fishing sectors using sea-based observers and/or monitors. The sectors without an observer programme include the linefish fishery, the swordfish fishery and the toothfish fishery. Even though the ICCAT obligations are to cover 5% of the swordfish catches, Namibia is not meeting these requirements. Similarly, CCAMLR requires 100% observer coverage, which is also not currently being implemented.

The goal of the FOA is to cover 100% of the fishing activities however; some sectors have fallen short of this target. For example hake longline, kingklip longline, shark longline and lobster trap have less than 60% coverage. If Namibia were to accomplish this target for all sectors then they would need to increase management and observer capacity (Refer to section 3.2. Quantifying capacity needs). For those sectors that already have 100% coverage then the only capacity need is to increase training. Furthermore Namibian observers generally undertake a monitoring role where compliance towards legislation is recorded. Therefore there is a need to develop additional skills for more advanced biological and scientific sampling.

Table 3: Summary of the fishing sectors, observer coverage and institution responsible for the Namibian observer programmes.

Fishery Sector	Effort Indicator (# of fishing days and trips per year)	Active sea-based Observer program (Y/N)	Active land-based monitor program (Y/N)	Current sea-based observer coverage (%)	Current land-based monitor coverage (%)	Framework and designated observer coverage (%)	Institution/ company responsible
Tuna longline (national)	632 days (8 trips)	Y		11%			Namibian flagged reg. in IOTC/ ICCAT. Sea-based observers supplied by
Tuna longline (foreign flag)		N				100%	Non-Namibian flag IOTC/ ICCAT member.
Tuna pole	902 days (45 trips)	Y		73%			MFMR/FOA
Longline (toothfish)		N				100%	CCAMLR registered.
Longline (swordfish)	63 days (1 trip)	N		0%		100%	MFMR/FOA
Bottom trawl (monk)	2765 days (122 trips)	Y		73%			MFMR/FOA
Longline (hake)	2894 days (364 trips)	Y		59%		100%	MFMR/FOA
Bottom Longline (kingklip)	41 days (5 trips)	Y		60%		100%	MFMR/FOA
Bottom Longline (shark)	1470 days (37 trips)	Y		35%			MFMR/FOA
Bottom trawl (hake)	11707 days (1140 trips)	Y		94%		100%	MFMR/FOA
			Y		1%		NatMirc port sampling programme
Midwater trawl (horse mackerel)	3692 days (309 trips)	Y		99%		100%	MFMR/FOA
Purse seine (small pelagics)	348 days (158 trips)	Y		98%		100%	MFMR/FOA
Trap (lobster)	3806 days (251 trips)	Y		34%			MFMR/FOA
Trap (Crab)	910 days (30 trips)	Y		67%		100%	MFMR/FOA
Linefish	3161 days (188 trips)	N		0%			MFMR/FOA

4.3. Angola

With a coastline stretching 1,650 km, Angola is rich in marine fisheries resources (Figure 8). Fishing in Angola has included both national and foreign fleets. Some of the foreign fishing fleets operating in Angolan waters were required by the government to land a portion of their catch at Angolan ports to increase the local supply of fish. Fishing agreements of this kind were reached with several countries, including with Spain, Japan, and Italy.



Figure 8: Map showing Angola's coastline and EEZ.

The primary fisheries in Angola are: (1) large-scale industrial fisheries, (2) semi-industrial fisheries; and (3) artisanal fisheries. The industrial fisheries sub-sector uses large to medium sized heavily mechanized vessels, which operate in national and international waters; the semi-industrial fisheries sub-sector is composed of small and medium sized vessels that fish in the EEZ; and the artisanal fisheries sub-sector is using canoes, planked boats and small vessels, with or without engines, that work in the coastal areas (within a designated zone close to shore).

The main commercial fish species in Angolan waters include horse mackerel (*Trachurus trachurus* in the South; *Trachurus trecae* in the North) and sardinellas (*Sardinella aurita* and *Sardinella maderensis*) which are exploited in smaller quantities and, despite their low fish grade, constitute a regular component of the diet of the coastal people. Small tunas are migratory species and include skipjack, bonito, frigate mackerel and “merima”, which feature as by-catch from the seiners. Large tunas are composed of yellow fin (*Thunnus albacares*), bigeye (*Thunnus obesus*) and bluefin (*Thunnus thynnus*), are species of international importance and are found on migration through Angolan waters at

certain times of the year. Other species of pelagic fish include the sardine (*Sardinella oscellata*), anchovy (*Engraulis hepsetus*) and galucha (*Ethmalosa fimbriata*).

4.3.1. Legislation and legal frameworks

Fisheries are mandated by the Ministry of Agriculture, Rural Development and Fisheries. They are responsible for the elaboration, direction, control and execution of the fisheries policy, the management of the fishing sectors, monitoring and enforcement, promoting the development of small scale fisheries, and technological and biological research. Angola has recently adopted a new Law on Aquatic Biological Resources (Law 6-A/04) (Lei dos Recursos Biológicos Aquático) (Appendix 4). This is the main law that governs the management of Angolan aquatic resources and was drafted in 2003 and promulgated in 2004. It established new principles and provisions regarding the sustainable management of marine resources including provisions and objectives established under international and regional agreements such as: UNCLOS (specifically the conservation and optimum utilization of living resources in Angola's Exclusive Economic Zone – EEZ), the SADC Fisheries Protocol and the (voluntary) FAO's Code of Conduct and Protocol on Responsible Fishing (including promoting the contribution of fisheries towards food security and livelihoods).

Under this legislation, monitors, scientific observers and community observers are defined as follows:

Monitors: Monitoring means the collection, compilation, analysis and provision of data and information on fisheries and related activities, including on processing and marketing of fish, aquaculture and hygiene and sanitary conditions of fish and fishery products.

Scientific observer: A technical or scientific researchers, duly authorized to conduct scientific observations or other similar duties, in particular on board a fishing vessel.

Community observers: Community observers are members of coastal and riverside communities designated under the conditions prescribed by regulation, for the monitoring of fishing and related activities in the areas reserved for artisanal fishing and subsistence referred to the Article 33.

The Fisheries Surveillance regulation related to fisheries observers and inspectors requires them to check fishing activities undertaken by fishing vessels in the maritime waters of Angola and by those flying the Angolan flag on the high seas, as well aquaculture and establishments for the processing of fish products. Vessels above a certain size (industrial and or semi-industrial greater than 18 m) must carry a vessel monitoring system and the monitoring directorate manages patrol boats (based in Luanda, Benguela, and Namibe provinces) and numerous smaller boats along the entire coast intended to monitor infringements into the exclusive artisanal fishing zone. Occasionally, a patrol and plane surveillance is undertaken such as was done by the SADC MCS project.

4.3.2. National institutional arrangements

The Ministry of Agriculture, Rural Development and Fisheries (MADRP) was established in 2010, following the dismantling of the previous Ministry of Fisheries (MF - established in 2002) and of the Ministry of Agriculture and Rural Development. The MF regulated the whole of the marine fisheries sector in Angola and was responsible for the development, execution, supervision and control of marine fisheries policy in Angola. The same responsibilities are now assumed by the MADRP (Figure 9). The Ministry of Environment (MMA) shares responsibilities for fisheries, working with one of the MADRP's national Directorates.

The MADRP is headed by a Minister and it has three Secretaries of State (one each for Agriculture, Rural Development and Fisheries) and a Vice-Minister of Forestry. The organogram (Figure 9) shows the structure of the MADRP. It is made up of an Advisory Council, a Technical Council, a Management Council, Policy and Administration Bodies and Technical Services. The MADRP has two national Directorates; The National Directorate of Fisheries Infrastructure and Industry (DNIIP) and The National Directorate of Fisheries and Aquaculture (DNPA).

There are five subordinate Institutes (parastatals): the Fisheries Research Institute (INIP), the National Institute for Support of Fisheries Industries (INAIP), the Artisanal Fisheries and Aquaculture Development Institute (IPA – now also responsible for aquaculture); the Fund for Support for Development of Fisheries Industries (FADEPA) and the Fisheries Schools (Figure 9).

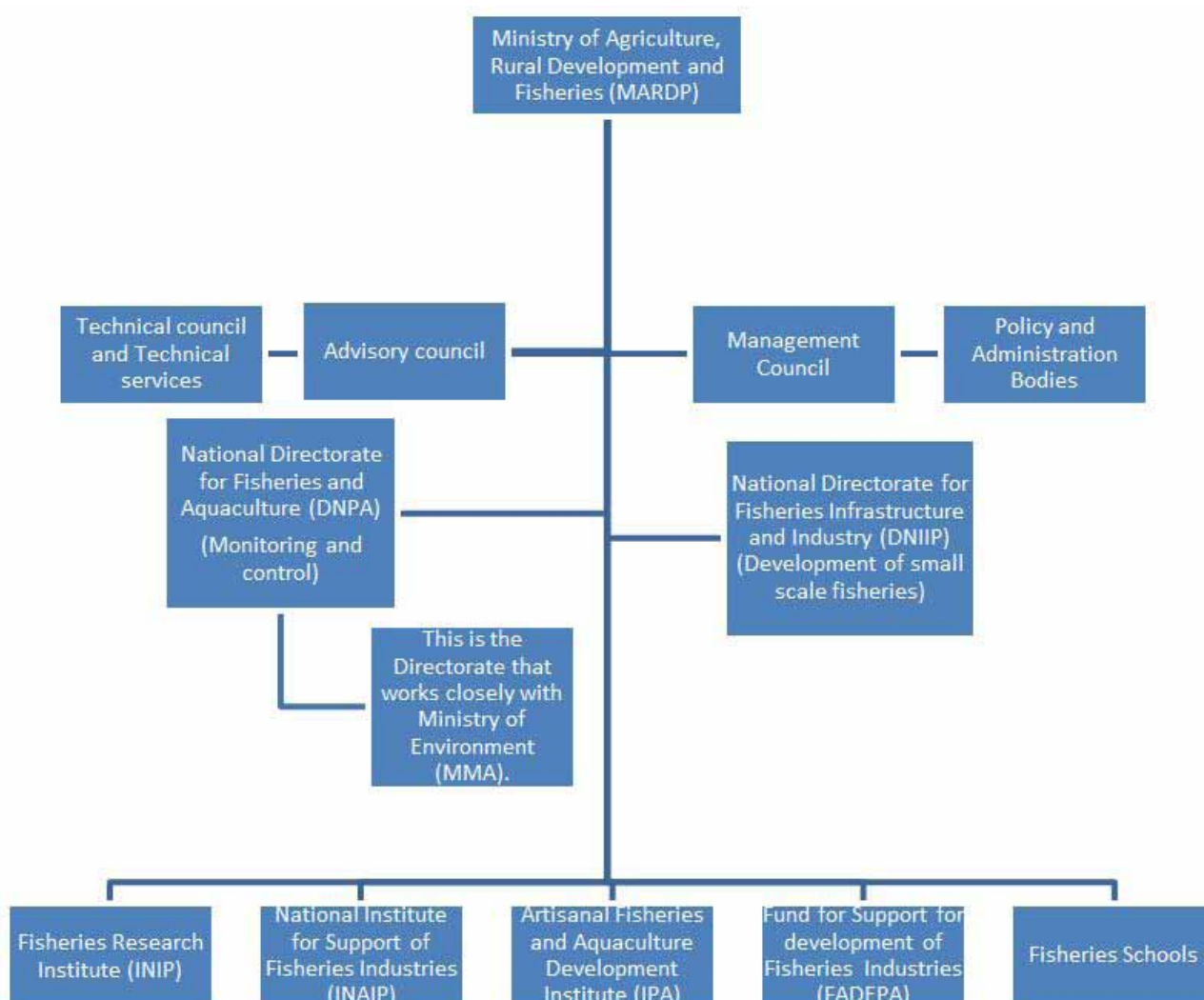


Figure 9: Organogram showing the institutional arrangements for MADRP.

4.3.3. Angolan observer programmes

4.3.3.1. Monitors and scientific observers

These samplers or monitors (classified herein as observers) are reported to collect data on fish captures in the artisanal sector (for five days a week) for up to 25 species in 55 communities (with plans to extend this coverage to another 15 communities to reach the target of monitoring 75% of fishing communities), 5 days a week. Data are gathered and processed by IPA every six months. Samplers are paid monthly by government out of a fishing levy and it was foreseen they would eventually be paid by fishing co-operatives in each village. The government will then take on three

or four extension workers in each province who will travel to different communities to undertake other fisheries work. Levels of monitoring have increased since 2000.

Observers and or inspectors are also deployed on industrial and semi-industrial vessels although actual deployment levels have not been provided suffice to say that DNPA have a sophisticated vessel monitoring unit and all commercial vessel landings are inspected.

Scientific observers are deployed from time to time (Velho pers comm.) to collect biological data although actual deployment levels were not provided for this evaluation.

4.3.3.2. *Community observers*

These observers are issued with an 'identification card' and collect biological samples, gather evidence of illegal fishing by industrial and semi-industrial vessels in that zone and report fisheries infringements to authorities. The Ministry supplies them with required equipment (e.g. binoculars, cameras, video machines, manual GPS, radios, mobile phones) and training. They do not have a surveillance role, are unpaid and do not receive any special government security protection. They communicate infringements and hand over evidence to surveillance officers.

4.3.4. *RFMO commitments*

Angola is a full member of the RFMOs and the International Commissions listed below;

- International Commission for the Conservation of Atlantic Tunas (ICCAT);
- South East Atlantic Fisheries Organisation (SEAFO);
- Benguela Current Commission (BCC);

Angola is also a member of the South African Development Community (SADC). However, SADC fisheries policy does not explicitly state observer's roles and responsibilities or whether they are required on fishing vessels. It is not clear to what extent Angola meets its obligations with regard to observer coverage in these RFMOs. Currently the SEAFO is planning training of observers although there are almost no fishing activities in SEAFO of any significance. As a member of ICCAT, Angola has to meet its obligations although the level of coverage of Angolan-licensed tuna-directed vessels has not been provided for this evaluation.

4.3.5. *Capacity needs*

Angola, like all other countries in the area lacks capacity in managing scientific observer programmes. The capacity in Angola is limited and is maintained by INIP. Angola does however have considerable capacity related to Inspectors and or Fishery Control Officers. This report however lacks any quantitative information in this regard and our evaluation remains largely qualitative¹.

¹Observer coverage was not provided by Angola therefore Table 4 is incomplete. The Information that is in this table however, was taken from various online resources and is representative rather than based on statistical information. i.e. All estimates are likely to be not reliable

Table 4: Angolan fisheries and estimates of Observer coverage

Fishery/vessel	Number of vessels	Number of observers on vessels	Number of observer days	% observer coverage
*Industrial fleet	Approx. 200	Two per vessel (i.e. 400 observers)	30 observer days per trip	unknown
Purse seiners	10			unknown
Trawlers	25			Unknown
Liner/gillnetters	100			unknown
Pole and line	27			unknown
Artisanal fleet				
“Chata’s”, small open boats with or without out-board engine but no in-board engine, on a daily basis	Approx. 9000		260 days per year	unknown

* Many vessels are not in use due to lack of repairs and maintenance and the absence of spare parts.

4.4. Mozambique

The Mozambican coastline is about 2 700 km with an EEZ of about 586,000 km² (Figure 10). The fisheries sector is divided into industrial, semi-industrial and small-scale sectors. The industrial and semi-industrial sectors target primarily shrimp and linefish, while the small-scale sector targets a range of small pelagic species, larger pelagic and demersal linefish species, as well as crustaceans such as shrimp and crab. Preliminary data from the census of artisanal fisheries, indicate that in 2012 there were about 343,000 fishermen and other professionals involved in the sector.



Figure 10: Map of Mozambique showing the EEZ.

In 2012, the semi-industrial and industrial fishing had over 400 vessels, where industrial fishing were 80 (of which 57 shrimp trawlers and 16 deep water crustacean trawlers) and semi-industrial fishing were 321 (238 for kapenta², 41 for demersal line fishing and 35 shrimp trawlers).

4.4.1. *Legislation and legal frameworks*

The Mozambique fishing activities are governed by the Fisheries Act No 3/90. In 1990, the government of Mozambique approved the general regulation of fisheries law, which filled some gaps in the Fisheries Law, namely with regard to licensing and enforcing. In 1996, the General Regulation of Maritime Fisheries was created and cancelled the previous revised regulation of 1971 (revised 1974). This regulation defined the typologies of fisheries by species, vessel size, and other specifications related to fisheries. It also specified size and season of authorized marine species and fishing requirements for the various fisheries. The current Marine Fisheries Regulation (REPMAR) was adopted in December, 2003 and is based upon modern management concepts and established the use of co-management in fisheries management, the obligatory use of devices to protect endangered species (TEDs) and to reduce the bycatch, and, for first time, the possibility to create artificial reefs (Castiano, 2004). During this period, a series of regulations were created namely: aquaculture, sport fishing, and many measures to solve problems in fisheries management. Generally, fisheries laws and maritime fisheries regulations are made at national level. Small resolutions could be for one regional area for example - Sofala Bank or Maputo bay. At the local level, there is no formal legislation. The principles of management at the local level are based upon traditional use of resources, such as the closed season for beach seines. This principle is not legally adopted but is locally implemented through co-management initiatives.

The decree sets out various regulations relating to: licensing; fisheries management and conservation measures; total allowable catches; fishing quotas; authorizations; participatory fishery management procedures ; the classification of fishing vessels and fishing types (artisanal, semi-industrial and industrial); monitoring and inspection procedures; fishing gear; and fishing methods. It does not however outline specifics regarding observers (Appendix 5)

4.4.2. *National institutional arrangements*

The Ministry of Sea, Inland Waters and Fisheries (MIMAIP) is the central organ of the Mozambican Government that, in defining the principles, objectives, priorities and tasks ensures the implementation of the policies, strategies and business plans in the sea areas, inland waters and fisheries. The public administration of the fisheries sector focuses on three components (Figure 11): the policy component formed by the Ministry of Fisheries (MdP) and its provincial directorates, the component of development promotion, and the component of fisheries management and implementation. The Ministry of Fisheries is the political body and coordinator of the fishery administration system. The main responsibilities of Ministry of Fisheries concerns the establishment of fisheries development policies, their translation into development plans, as well as the coordination of its implementation through a performance control of the system components.

The fisheries management subsystem consists of the National Institute of Fisheries Research (IIP) whose function is the research and management of fishing resources; and the National Fisheries Administration (ADNAP) that defines the management planning, the conditions of access to the

²Kapenta is caught in *Cahora basa* (freshwater)

fishing resources and monitors and manages the fisheries. The National Institute of Fish Inspection (INIP) is responsible for ensuring the quality of fishery products.

The subsystem of development promotion consists of the National Institute of Development of Small Scale Fisheries (IDPPE) that has the mission to promote and assist the development of small scale fisheries, focusing on poverty reduction and improving the living standard of fishing communities. The National Institute of Aquaculture (INAQUA) is responsible for the promotion and management of aquaculture activities and the Fisheries Development Fund (FFP) is a financial institution with the mandate to provide credit mechanisms for the development of fisheries. The School of Fisheries (EP) provides basic and medium level training in various fishing areas.

The Fisheries Administration has a local presence in the provinces and districts, through the delegations from central institutions. In the district, the jurisdiction for the licensing and surveillance of the artisanal fishing is assigned to the administrator, who is responsible for organising this decentralised capacity within a framework of co-management of the artisanal fisheries. The National Directorate for Fisheries Law Enforcement (NDFP) is responsible for the compliance of all fishing sectors with the national laws and regulations and the requirements of the international Agreements to which Mozambique is a party. The ‘deterrent approach’ to law enforcement is commonly used for the educated and larger industrial and foreign fisheries while ‘voluntary compliance’ techniques are being developed for the more vulnerable small scale and artisanal fisheries.

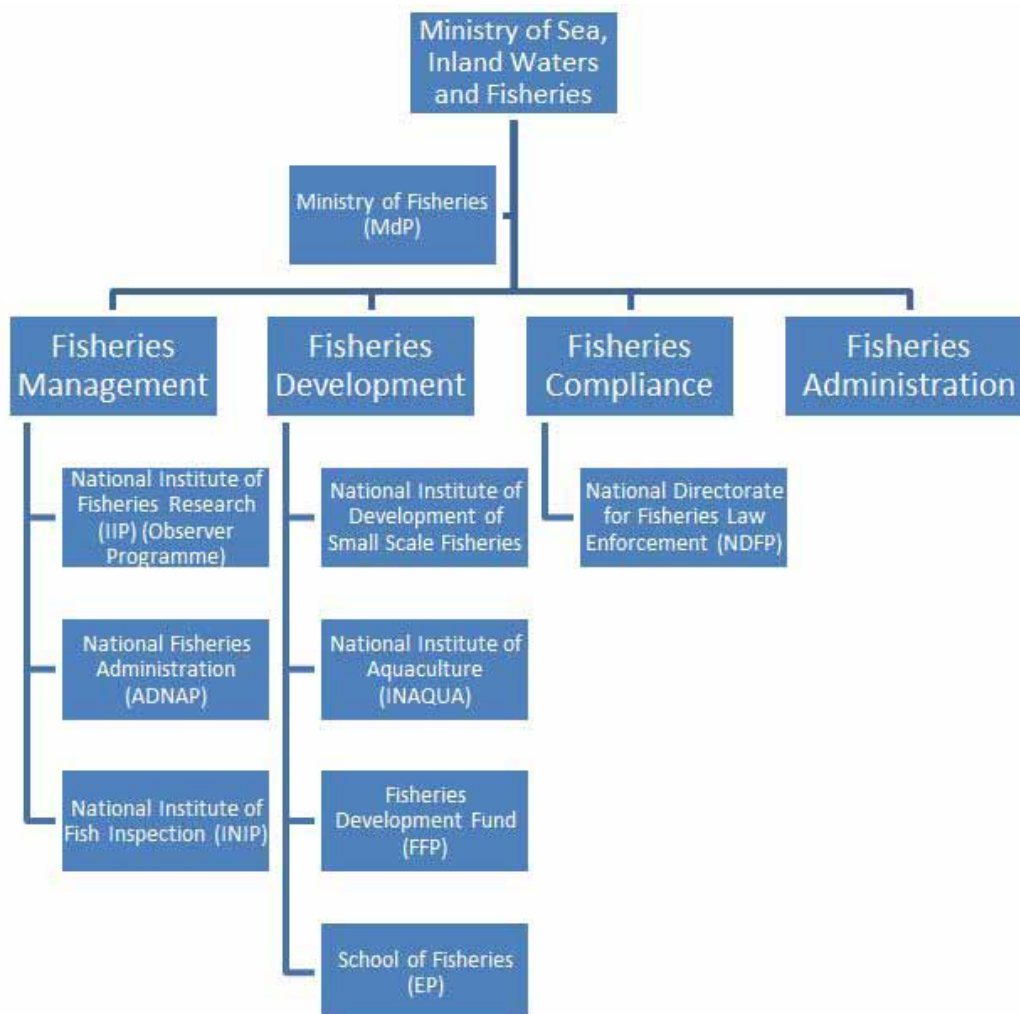


Figure 11: Organogram showing the structure of the Ministry of Fisheries in Mozambique

4.4.3. *Mozambique observer programmes*

In Mozambique the collection of fisheries data and statistics is under mandate of Ministry of Sea, Inland waters and Fisheries (MIMAIP). The fisheries data collected includes catch and effort, environmental data and socio-economic data. Each category of data is collected under the responsibility of one or more of the four institutions of the MIMAIP; the National Fisheries Administration (ADNAP), the National Fisheries Research Institute (IIP), the National Institute for the Development of Small Scale Fisheries (IDPPE) and the National Directorate of Fisheries Economy and Policy (DNEPP)

All the fisheries except the subsistence fisheries (invertebrate collectors), are subjected to scientific monitoring program implemented by the Fishery Research Institute (IIP). The on-board observer program is conducted in semi-industrial and industrial commercial fisheries while the catch and effort from the artisanal fisheries are monitored by a National Stratified Random Sampling System locally known as SNAPA (Sistema Nacional de Amostragem da Pesca Artesanal). Recreational and sport fisheries are covered by on landing site sampling during the disembarkation on the local of the fishing completion. Logbooks and other monitoring tools are also used as part of monitoring system. Logbooks are monitored by ADNAP which also issue the fishing licences. However, the information from the logbooks is shared with IIP when required. The IIP also conduct specific studies as a tool to fill the gaps of both monitored and not monitored fisheries.

The national scientific observer programmes cover the sectors targeting shallow water shrimps, deep-water shrimps and the demersal linefishery fish. It has been also implemented on the national flagged tuna longliners. The recreational fishing is the least monitored fishery. IIP distribute fishing catch cards to many lodges and hotels where recreational fishing is a current activity but the level of cooperation from guests to return these cards is very low. The cards were supposed to be filled per outing but the tourist fishers do not accept the cards or they forget to fill out the cards.

4.4.4. *RFMO commitments*

Mozambique is an active participant in RFMOs aimed at the promotion of the sustainable use of fishing resources as, for example:

- Commission for the Conservation of Antarctic Marine Living Resources (CCAMLR);
- Indian Ocean Tuna Commission (IOTC)
- Southwest Indian Ocean Fisheries Commission (SWIOFC).

Mozambique is meeting the RFMO commitments and obligations (see Section 6 for details on RFMO commitments with respect to observer coverage). Mozambique is also a member of the South African Development Community (SADC), however the SADC fisheries policy does not explicitly state observer's roles and responsibilities or whether they are required on fishing vessels. Further, Mozambique is also a signatory to South Indian Ocean Fisheries Agreement (SIOFA) but has not yet been ratified.

4.4.5. *Capacity needs*

Currently Mozambique monitors the tuna longline (domestic and foreign flag), the industrial and semi-industrial linefish fishery, the artisanal sector and the industrial shrimp fisheries (shallow and deep water). Scientific observer coverage amounts to approximately 10% per fishery. There is also a small amount of monitoring of the recreational fisheries.

Mozambique is committed to the IOTC initiatives to carry out scientific monitoring of 5% of the tuna fleet. The Fishery Research Institute has eight scientific tuna observers who have been trained under the SWIOFP and have the respective registration and certification. A course for training new scientific observer for tuna fisheries has been planned for 2016.

Mozambique needs to increase national observer coverage for all sectors but particularly for the artisanal sector. The artisanal sector represents 90% of the country's catch and even though data collection systems are in place, implemented by the Fisheries Research Institute, it still doesn't cover enough information. The number of observer managers and observers required to achieve the desired coverage of artisanal fisheries is dependent on the number of fish landing sites or fishing villages (Refer to section 3.2. Quantifying capacity needs).

The recreational and sport fishing sectors rely on the public fisher to submit catch cards but this doesn't appear to be very successful. There is a need to increase public awareness and training regarding the importance of monitoring and recording catches on the cards provided.

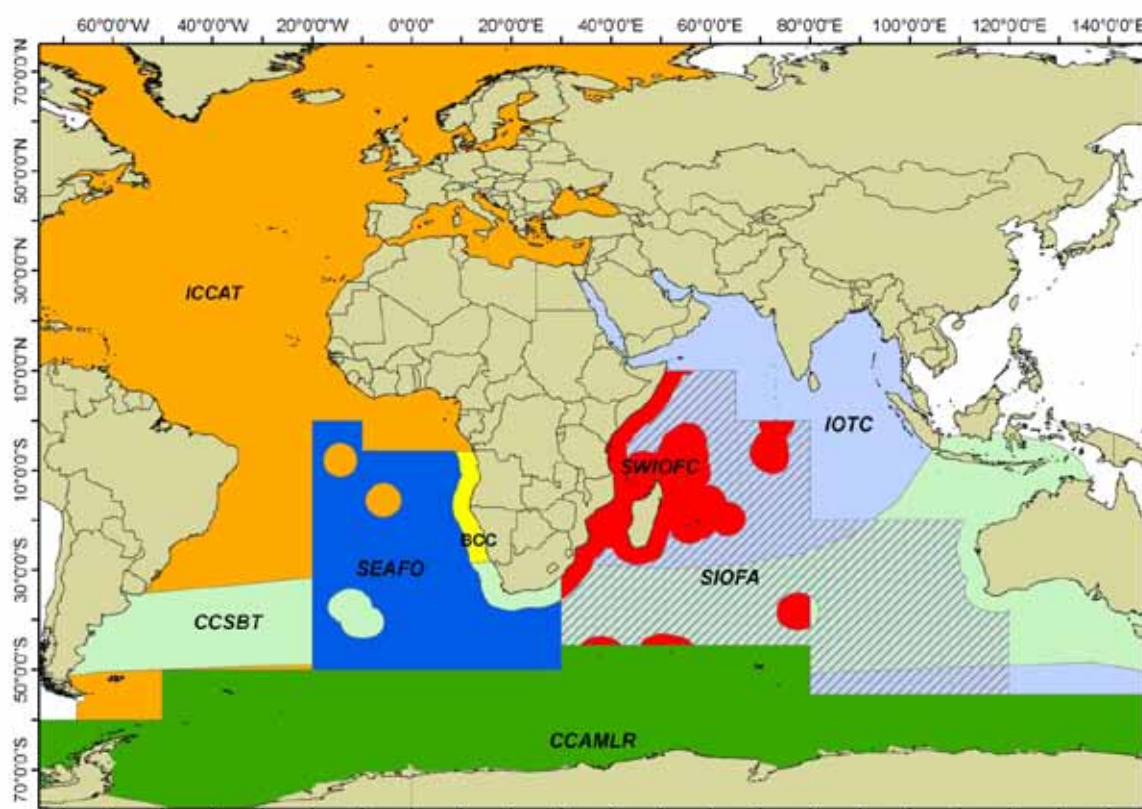
Table 5: Summary of the observer coverage per fishery in Mozambique.

Fishery Sector	Effort Indicator (TAC in tonnes/ vessels and licences)	Active sea-based Observer program (Y/N)	Active land-based monitor program (Y/N)	Current sea-based observer coverage (% , number of observer days)	Current land-based monitor coverage (% , number of monitor days)	Framework and designated observer coverage (% or # of observer days per year)	Institution/ company responsible
Tuna longline (foreign flag)	5396 tonnes (56 vessels)	Y		5-10%		5%	IIP under IOTC regulations
Industrial and semi-industrial line fish fishery	660 t (143 vessels) 72 licenses	Y	Y	5-10%	5-10%		IIP
Artisanal Sector (all fisheries)	150,000 tons/year (39550 vessels)		Y		1-3%		IIP
Industrial Shallow water trawl (shrimp)	8520 t	Y	Y	5-10%	5-10%		IIP
Industrial Deep water trawl (shrimp)	1774 t	Y		10-15%			IIP
Recreational fisheries	4853 licenses				<5%		IIP

5. Review of regional fisheries observer programmes in the Southern Region

Areas Beyond National Jurisdiction (ABNJ) are mostly managed by Regional Fisheries Management Organisations (RFMOs) or international commissions, whose objectives are the management and conservation of shared fish stocks within their region. Also RFMOs might be coastal states with shared resources and which have common management objectives.

In such organisations, members can be either full members (Contracting Parties) or partial members with an interest only but not full voting rights (Cooperating non-Contracting Parties or CPCs). These regional bodies typically have Conservation or Management Measures (CMMs) in place requiring vessels to accommodate scientific fisheries observers. RFMOs that have regional observer programs and play a role in the countries belonging to the southern region of Africa include the ICCAT, IOTC, SEAFO, BCC, CCAMLR, SWIOFC, SIOFA and the CCSBT, their respective areas of jurisdiction are shown in Figure 12. Other regional bodies might also have fisheries portfolios such as the Southern African Development Community (SADC) and the Indian Ocean Community (IOC).



ICCAT – South Africa, Namibia, Angola; IOTC – South Africa, Mozambique; SEAFO – South Africa, Namibia, Angola; BCC – South Africa, Namibia, Angola; CCAMLR – South Africa, Namibia; SWIOFC – South Africa, Mozambique; CCSBT – South Africa; SIOFA – Mozambique
Figure 12: Location of Regional Fisheries Management Organisations (RFMOs) for the southern region countries.

5.1. The South Indian Ocean Fisheries Agreement (SIOFA)

SIOFA is an instrument applicable to the High Seas of the South West Indian Ocean that entered into force on 21 June 2012. Signatories and participants to the Agreement are Australia, Comoros, EU, France, Kenya, Madagascar, Mauritius, Mozambique, New Zealand and Seychelles. Countries acceding to the Agreement are Australia, Cook Islands, Japan, Mauritius and the Republic of Korea. The Agreement recognises the need to collect data concerning fishing activities involving non-tuna species in the high seas of the Southern Indian Ocean to assess effort and stock levels. Although

there is no specific Article within the Agreement that refers to scientific observation or observers there is included in the agreement the Resolution on Data Collection Concerning the High Seas. The data requirements centre on fishing vessel information, and catch data. The catch data is reported as weight per species caught.

5.2. The International Commission for the Conservation of Atlantic Tunas (ICCAT)

The International Commission for the Conservation of Atlantic Tunas (ICCAT) is an inter-governmental fishery organization responsible for the conservation of tunas and tuna-like species in the Atlantic Ocean and its adjacent seas. The Convention entered into force in 1969. Currently there are 50 contracting parties to the Convention. In the Southern region of Africa these countries include Angola, Namibia, and South Africa. The Commission's work is dependent on up-to-date scientific and statistical data relative to current conditions and trends of fisheries resources in order to manage the effects of fishing on stock abundance. Similarly the Commission investigates the effects of tuna fishing on non-target or "bycatch" species in the convention area, these are principally shark species. About 30 species are covered by the Convention.

In accordance with the Convention, the Commission can adopt Resolutions and Recommendations aimed at maintaining the populations of ICCAT species at levels which will permit maximum sustainable catch.

The active ICCAT Recommendation of 2010-10 pertains to observer programmes in the ICCAT area of competence. In acknowledging the importance of observer programs in developing and implementing an ecosystem approach to fisheries management and recognizing that observer programs are used successfully on both the national and RFMO level for the purpose of collecting scientific data, ICCAT made a Recommendation "to establish minimum observer standards for fishing vessel scientific observers programs". This Recommendation applies to each of Contracting Parties and CPCs. Pertinent sections of Recommendation 10-10 are as follows:

- A minimum of 5% observer coverage of fishing effort in each of the pelagic longline, purse seine, and, as defined in the ICCAT glossary, baitboat fisheries, as measured in number of sets or trips for purse seine fisheries; fishing days, number of sets, or trips for pelagic longline fisheries; or in fishing days in baitboat fisheries;
- The Commission shall take due regard of the special requirements of developing States in the implementation of the provisions of this Recommendation.
- CPCs shall also provide a preliminary report to SCRS by 31 July 2011 on the structure and design of their domestic observer programs to be followed by an updated report on 31 July 2012. These reports shall include, inter alia, the following information:
 - a. target level of observer coverage by fishery and how measured,
 - b. data required to be collected,
 - c. data protocols in place,
 - d. information on how vessels are selected for coverage to achieve the CPC's target level of observer coverage,
 - e. observer training requirements, including any training materials, such as a training manual,
 - f. observer qualification requirements.

5.3. The Indian Ocean Tuna Commission (IOTC)

The IOTC is an intergovernmental organisation established under Article XIV of the Food and Agriculture Organisations (FAO) Constitution and is located in the FAO framework. Conceived in 1993 the treaty -The Agreement for the Establishment of the Indian Ocean Tuna Commission -entered into force on 27 March 1996. There are currently 32 members of the IOTC and 5 Cooperating Non-Contracting Parties (CNCP). Members from the Southern region of Africa include South Africa and Mozambique. The Commissions' role is to promote cooperation among its Members to ensure the conservation and optimum utilisation of tuna and tuna-like species in the Indian Ocean while simultaneously encouraging the development of fisheries based on those stocks.

Part of the IOTC Conservation or Management Measures (CMMs) is the co-ordination of a regional scientific observer program. At each session of the Commission, Members may adopt CMMs for the management of tuna and tuna-like species under the IOTC mandate, as well as for the fisheries targeting them. Decisions made by the Commission are passed in the form of Resolutions or Recommendations. Resolutions are binding to Commission Members whilst Recommendations are not binding on the Members.

The IOTC recommended that a regional scientific observer programme to enhance data collection (also for non–target species) and ensure a unified approach be established. The primary objective was for the “building on the experience of other RFMOs and that regional standards on data collection, data exchange and training should be developed”. The IOTC therefore adopted the following Resolution:

Resolution 11/04 (superseding Res.09/04 and Res. 10/04) – On a Regional Observer Scheme is the current and active CMM applicable to the IOTC area of competence and its Members and provides a framework for putting in place a national scientific observer program. The Regional Observers Scheme commenced July 1st 2010, and is based on national implementation. The objective of the observer scheme is to collect verified catch data and other scientific data related to the fisheries for tuna and tuna-like species in the IOTC area of competence. Observer programmes can be used for quantifying species composition of target species, by catch, by-products and dead discards, collecting tag returns, etc. The Secretariat coordinated the preparation of standards for data requirements, training and forms, however implementation by CPCs has been limited to date. The IOTC recognises the implementation of a regional scientific observer program as a high priority and defines its current state of implementation as partially completed.

Resolution 11/04 defines an Observer as, “a person who collects information on board fishing vessels”. Notably, the Resolution differentiates between an Observer and a Field Officer, defining the latter as: “a person who collects information on land during the unloading of fishing vessels”.

Under the Observer scheme, the IOTC requires that:

At least 5 % of the number of operations/sets for each gear type by the fleet of each CPC while fishing in the IOTC area of competence, for vessels of 24 meters overall length and over, and for vessels under 24 meters if they fish outside their Exclusive Economic Zone (EEZ) shall be covered by this observer scheme. For vessels under 24 meters if they fish outside their EEZ, the above mentioned coverage should be achieved progressively by January 2013.

In this regard the IOTC resolution states that Cooperating Parties shall:

- a. Have the primary responsibility to obtain qualified observers. Each CPC may choose to use either deployed national or non-national of the flag State of the vessel on which they are deployed;
- b. Endeavour that the minimum level of coverage is met and that the observed vessels are a representative sample of the gear types active in their fleet;
- c. Take all necessary measures to ensure that observers are able to carry out their duties in a competent and safe manner;
- d. Endeavour to ensure that the observers alternate vessels between their assignments. Observers are not to perform duties, other than those described in paragraph 10 and 11 below
- e. Ensure that the vessel on which an observer is placed shall provide suitable food and lodging during the observer's deployment at the same level as the officers, where possible. Vessel masters shall ensure that all necessary cooperation is extended to observers in order for them to carry out their duties safely including providing access, as required, to the retained catch, and catch which is intended to be discarded.

Further, an observer shall, inter alia:

- a. record and report fishing activities, verify positions of the vessel;
- b. observe and estimate catches as far as possible with a view to identifying catch composition and monitoring discards, by-catches and size frequency;
- c. record the gear type, mesh size and attachments employed by the master;
- d. collect information to enable the cross-checking of entries made to the logbooks (species composition and quantities, live and processed weight and location, where available); and
- e. carry out such other scientific work as requested by the IOTC Scientific Committee.

Field samplers (as opposed to observers) shall monitor catches at the landing place with a view to estimating catch-at-size by type of boat, gear and species, or carry out such scientific work as requested by the IOTC Scientific Committee.

The IOTC has an effective management framework in place to implement and coordinate a regional observer program. The program is however still dependant on contracting nations to train and deploy observers and this is a shortfall in developing nations that do not have the capacity to monitor fishing activities in their EEZ. Attempts have been made to train national observers to regional standards, these are somewhat ineffective in the face of insubstantial management and coordination at a national level.

Through IOTC Resolution 12/05 On Establishing a Programme for Transshipment by Large-Scale Fishing Vessels the IOTC supervises the execution of a Regional Observer Program to monitor transshipments at sea with the aim of preventing laundering of fish at sea. Supervision by the Compliance Section of the IOTC includes approving the training programme for the observers, approving the recruitment of observers, approving the deployment of observers and reports produced by the observers. Execution of the program is outsourced by the IOTC to the Consortium of Marine Resources Assessment Group and Capricorn Fisheries Monitoring cc who are responsible for the training and provision of qualified observers, managing the logistics for the deployment of observers and their repatriation at the end of the deployment and maintaining the IOTC regional observer programme database.

All transshipments at sea are banned within the IOTC area of jurisdiction (Figure 10), excepting those that are carried out by authorised carrier vessels (as per submission of carrier vessel lists by CPCs). The costs of the programme are financed by the flag CPCs of the large scale fishing vessels wanting to engage in transshipments at sea. According to the IOTC Report from 2013 (IOTC-2013-COC10-04aE]) a total of 45 observer deployments were approved during which 801 transshipment operations were observed. A total of 43,339 tonnes of fish were transhipped and differentiated by species weights transhipped. Overall tunas and billfishes accounted for 91.8% of all species transhipped. No data has been reported for 2014 or 2015 as yet.

The difference between this program (transshipment) and the Regional Observer Scheme is that the IOTC, a single management unit, is in charge of supervision and implementation, whereas in the Regional scheme it is the responsibility of CPCs to establish monitoring programmes for fishing vessels operating in their waters of under their flag.

5.4. The South East Atlantic Fisheries Organisation (SEAFO)

The Convention on the conservation and management of fishery resources in the South East Atlantic Ocean was signed in April of 2001 by the southern region countries; Angola, Namibia and South Africa. The Convention was the first to create a regional management organisation. In principle the intentions of the Convention were much like the United Nations Agreement for the Implementation of the Provisions of the United Nations Convention on the Law of the Sea of 10 December 1982 relating to the Conservation and Management of Straddling Fish Stocks and Highly Migratory Fish Stocks (UNFSA). The SEAFO Convention however recognises that “the long term conservation and sustainable use of high seas fisheries resources require cooperation among States” and this inclusion of high seas stocks takes it beyond the scope of UNFSA.

In accordance with the Convention, Article 16, SEAFO has had in place since February 2013 a “System of Observation, Inspection, Compliance and Enforcement (System)” that applies to all fishing vessels and fishing research vessels operating or intending to operate in the Convention Area. An updated System was adopted by SEAFO to enter into force in February 2016. The Convention stated that the system would comprise the elements of an observer program based on common standards for the conduct of observation, including, inter alia, arrangements for the placing of observers by a Contracting Party on vessels flying the flag of another Contracting Party with the consent of that Party; an appropriate level of coverage for different sizes and types of fishing vessels and fishery research vessels; and measures for reporting by observers of information regarding apparent violations of conservation and management measures, taking into account the need to ensure the safety of observers. The System, Chapter V, Article 18 – Scientific Observer Program does not however detail specific observer requirements nor vessel requirements. Article 18 states that:

1. Each Contracting Party shall ensure that all its vessels operating in the Convention Area shall carry scientific observers qualified by the flag State. Flag States shall ensure that the relevant data is transmitted to the Executive Secretary in the format specified by the Scientific Committee using the scientific observer forms and report template as provided in the Reporting Forms section on the SEAFO website.
2. Each Contracting Party shall require the submission of this information, in respect of each vessel flying its flag, within 30 days of leaving the Convention Area. The Contracting Party shall provide a copy of the information to the Executive Secretary as soon as possible, taking account of the need to maintain confidentiality of non-aggregated data

It is therefore the responsibility of the CPCs to implement the System of Observation, Inspection, Compliance and Enforcement.

5.5. The South West Indian Ocean Fisheries Commission (SWIOFC)

The SWIOFC cooperated in the guidance and coordination of the South West Indian Ocean Fisheries Project (SWIOFP), a regional fisheries research project that focused on commercial fisheries resources that are shared between member countries. The program ran from 2008 to 2013 and included nine West Indian Ocean countries (Comoros, France, Kenya, Madagascar, Mauritius, Mozambique, Seychelles, South Africa and Tanzania). France was included in SWIOFP because of its islands in the region (i.e. Reunion and scattered islands in the Mozambique Channel).

The rationale of SWIOFP was that enhanced knowledge of the offshore marine environment would assist its member countries to implement a regional strategy for managing shared fish stocks and conserving biodiversity. To achieve its objectives the SWIOFP required “at sea” data collection collected by:

- Research ships;
- Wet-leased (chartered) fishing vessels; and
- Fisheries Observers placed on board commercial fishing vessels

An output of the SWIOFP was a comprehensive Observer training programme that included formats for:

- Observer logistics co-ordinator work guidelines;
- An Observer Manual, briefing and debriefing protocols;
- Memorandum of Understanding (between specific institution and vessel owner) for carrying Observers; and
- A data collection guide combined with data forms and sampling protocols.

Following on from the SWIOFP was the strengthening of the SWIOFC and the relocation of the organisation to Maputo in late 2015. SWIOFC then also took on the responsibility of the regional component of the new national and regional fisheries project “The South West Indian Ocean Fisheries Governance and Shared Growth Program (SWIOFish-I Program)”. This new regional project, which in its first five years includes Tanzania, Mozambique, Madagascar and Comoros incorporates elements related to the development of fisheries observer capacity in these countries and the SWIO as a whole.

5.6. Commission for the Conservation of Antarctic Marine Living Resources (CCAMLR)

The Commission for the Conservation of Antarctic Marine Living Resources (CCAMLR) was established on 7 April 1982 in response to concerns that the exploitation of Antarctic marine resources were largely unregulated and unsustainable. There are 25 member states that have ratified The Convention on the Conservation of Antarctic Living Marine Resources (CAML, 1982). The members from the southern region of Africa are South Africa and Namibia.

The CCAMLR Scheme of International Scientific Observation (SISO), adopted in 1992 under Article XXIV of the Convention describes the Commissions requirements for a regional observer program. Information from the observer program is a fundamental part of the CCAMLR management approach. The scheme provides independent scientific data that are crucial input data for the assessment of target and by-catch fish species. It also allows the implementation and effectiveness of management

measures to reduce incidental mortality associated with fisheries to be monitored. Fisheries in the CCAMLR region take place in areas where few national research surveys are undertaken and therefore the data from the scheme are also invaluable in understanding the ecosystem of the Southern Ocean.

In order to assist CCAMLR Members and their observers in planning observation programs and recording data, the CCAMLR Secretariat, in consultation with the Scientific Committee and its working groups, developed the Scientific Observers Manual 2011. The manual contains a number of guidelines for scientific observations and reference materials.

100% of fishing vessels within the CCAMLR area of competence are required to have a scientific observer on-board. Although CCAMLR is beyond the scope of this report, some Indian Ocean countries are members of CCAMLR (France and South Africa, Mauritius is an acceding State) and must comply with the observer protocol developed by CCAMLR. In the case of France (Reunion) and South Africa, observers are deployed on all vessels fishing under these flags in the CCAMLR convention area. CCAMLR has a highly developed observer programme that in many ways has laid the foundation for other RFMOs. Further, some African coastal countries have in the past allowed CCAMLR vessels fishing in CCAMLR (either legally or illegally) to land catch in their ports.

5.7. Commission for the Conservation of Southern Bluefin Tuna (CCSBT)

The Commission for the Conservation of Southern Bluefin Tuna (CCSBT) manages the stock of southern bluefin tuna throughout its distribution through intergovernmental cooperation. The Convention was established on 20 May 1994 succeeding an earlier management arrangement between Australia, Japan and New Zealand. Joining those three nations as members were Indonesia, the Fishing Entity of Taiwan, Republic of Korea and the European Union. Co-operating Non-Members with an interest in the fishery are South Africa and the Philippines. Through appropriate management the Commission seeks to maintain optimum utilisation of southern bluefin tuna as well as its conservation.

The CCSBT has adopted a Scientific Research Program (SRP) with an overall objective of improving the quality of the data and information used as input to the stock assessment for Southern Bluefin Tuna (SBT), contributing to the development of reliable indices to monitor future trends in SBT stock size and identifying directions for further scientific research. At CCSBT7 in April 2001 the Commission adopted the report of the Fifth Meeting of Scientific Committee, which recommended a SRP incorporating a Scientific Observer Program as one of four priority elements. The Observer Program endorsed by the Commission comprised the following features:

- an observer coverage of 10% for catch and effort as a target level;
- the level of observer coverage for estimation of tag reporting rates will depend on the scale of the tagging program subsequently agreed by the Commission and the tag recapture rate;
- standards for training of observers, operation of observer programs and the data to be collected including the forms to be used will be prepared;
- data collected would become part of the CCSBT database as subsequently agreed in CCSBT protocols;
- member countries will be responsible for operation of observers in high seas and domestic EEZ fisheries on their flag vessels;

- all fleet components should be observed and target levels of observer coverage should be the same for all fleet components;
- an exchange of observers between countries on a regular basis should be encouraged to maintain consistency and increase mutual trust in the results of the observer program; and
- recruitment of some observers from non-member nations would be encouraged.

CCSBT Scientific Observer Program Standards (2015) includes information on SRP Background, Objectives, Responsibility for program operation, Coverage requirements, Levels of scientific observer coverage, Assignment of scientific observers to vessels, Tagging program, Recruitment and training of Observers, The observed vessel, Information and data requirements, Reporting requirements and Confidentiality of data and information

5.8. Southern African Development Community (SADC)

SADC boasts membership of East and West African coastal states as well as east African island nations. The Protocol on Fisheries (2006) describes the roles and responsibilities of member states with respect to inland and marine fishery resources. Although SADC does not provide instruction for the development and implementation of national or regional observer programs it does recommend that its members agree on management plans for shared resources that may include the following components:

- harmonised, or integrated systems to monitor resources and their exploitation, joint fish stock assessment programmes, agreed scientific methodologies for determination of the state of stocks and preparation of best scientific advice on sustainable levels of exploitation;
- agreed management measures and specification of means for implementing and enforcing such measures;
- principles, policies, and means for allocation of shared resources; and
- means for fostering joint venture enterprises.

The above objectives mimic those of the majority of regional bodies that have developed observer programmes to monitor fishing activities. A SADC driven initiative to develop a regional fisheries observer program has the potential to be effective in standardising procedures, data gathering and sharing, training and management and international collaboration in the southern, eastern and western regions of Africa.

6. Framework for establishing a sea-based regional fisheries observer programme

A regional fisheries observer programme will have benefits for the regional and national organisations involved but benefits will also accrue to the observers, the vessel owners and the Fisheries Management Authorities (FMAs), in terms of shared training and management costs, dual use of observers and easier movement of vessels between nationally and regionally managed waters. Furthermore a well-trained and structured regional fisheries observer programme covering all licensed vessels would not only complement existing MCS systems but would also increase accurate reporting of, for example, fishing positions, illegal fish transfer, daily catches and species composition, which are all vital for sustainable management of fishing practices. An on-going example of a regional observer programme is the Indian Ocean Tuna Commission (IOTC) initiative to monitor transshipments by large scale fishing vessels.

It should be noted that even though observer data can be collected onboard fishing vessels or at landing sites/ports, processing plants or market places, this framework only focuses on the work of sea-based observers and the regional programme that supports them. The principles and practices however could also apply to other observer programmes.

Figure 13 shows a generic framework for establishing a regional sea-based fisheries observer programme. There are three main components;

1. The inputs : Objectives, legal framework and financial
2. The logistics : Structure, training, monitoring and sampling
3. The outputs : Data and reporting

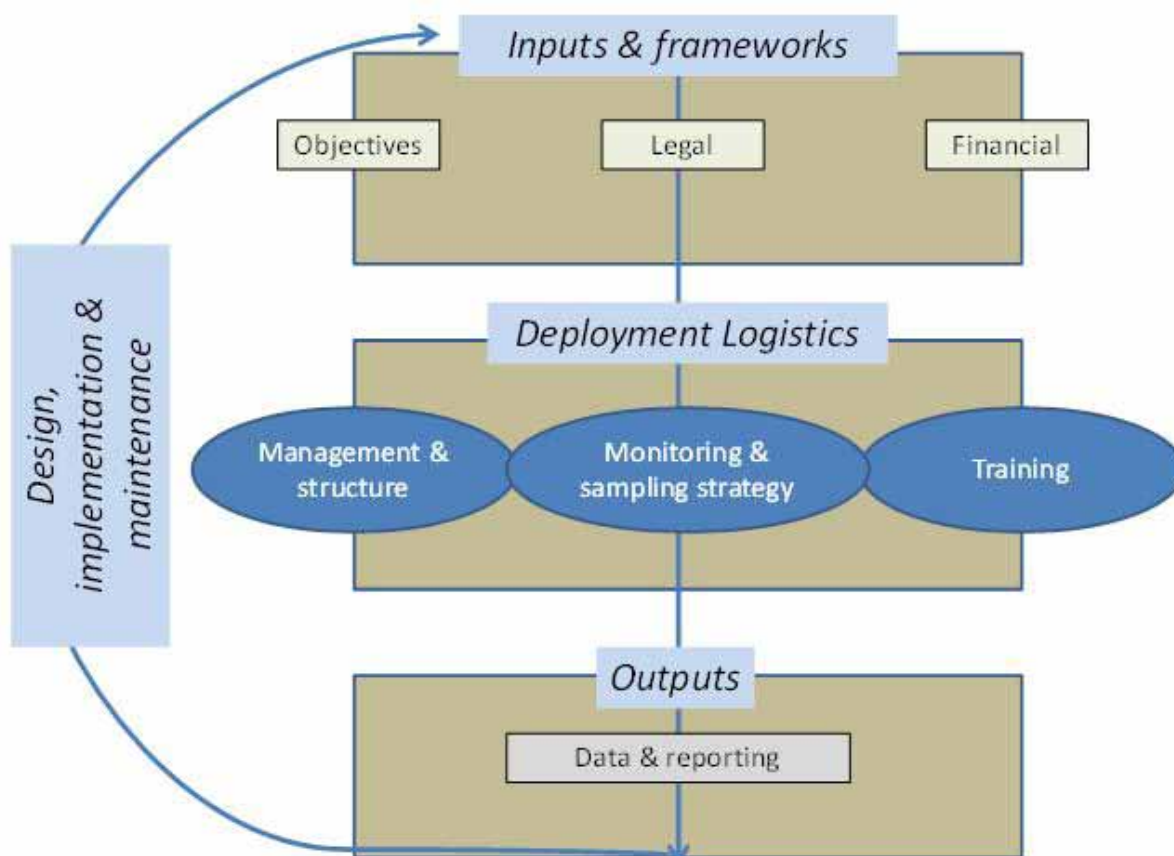


Figure 13: Generic framework for establishing a sea-based observer programme (FOA 2003)

6.1. Objectives for a regional observer programme

Observer programmes are generally implemented to collect data for both scientific and compliance purposes, which in turn serve wider fisheries management objectives⁴. It is therefore important to establish clear objectives before implementing an observer programme. These may include objectives for scientific information (total catch and effort including bycatch, discards and high grading, biological sampling of catches [e.g. diet, spawning condition, fish length, condition etc.]) and/or compliance information (observation of fisheries laws, regulations and plans, permit controls and validation of vessel logbooks). Both scientific and compliance information are needed for sustainable fisheries management. For example determining fishing season, open and closed areas, production estimates, conversion factors, marketable and non-marketable catches, improved communication with fishers, gear improvements, and estimates of pollution levels.

In addition UNCLOS Articles 61, 62, 63 and 64 specify that signatories have an obligation to utilise and conserve living resources as well as provide observers and specify fisheries research programmes and guidelines. In particular this relates to the UN Fish Stocks agreement (A/CONF.164/37, 1995) on highly migratory species and also on stocks of a transboundary nature. Coastal and Island states have obligations to monitor fisheries, collect relevant data for their management and also to prevent and deter illegal fishing (IUU). These would be the key rationale for developing a Regional Observer Programme (ROP).

6.2. Legal framework

“Fisheries law” comprises of legislation, regulations, administration and international agreements, all of which can be shaped by a government into a set of instruments for implementing fisheries policy. The main purpose of fisheries legislation is to provide a legal basis for the management of a fishery, thus creating a legal framework governing exploitation and other aspects such as compliance and fishing rights.

The most common legal instruments that provide legislation for placing an observer onboard a vessel at a national level include; the Act, the Regulations, conditions for vessel licensing and any special requirements for access (e.g. bilateral access agreements). In the case of regionally managed fisheries there are agreements in place for the acceptance of observers on vessels fishing within specified areas of jurisdiction. This is usually in the form of a convention with associated arrangements and/or agreements dealing with fundamentals such as nationality of observers, qualifications, roles, responsibilities, duties, reporting systems and financial agreements. Guidelines for regional organisation are given in the UN Fish Stocks Agreement (UNFSA) (A/CONF.164/37, 1995).

The placement of observers in terms of national and/or international programmes therefore requires a “legal mandate”. The mandate provides the legal obligation for a vessel to accommodate an observer when requested and outlines the conditions for these deployments. An observer coordinator can therefore request a vessel to accommodate an observer in accordance with this mandate. It should also be kept in mind that all signatories to UNCLOS have also agreed to carry observers as prescribed in Article 62 – that is a vessel not carrying the flag of the coastal state when fishing inside the EEZ of the coastal state may be obligated under the permit conditions specified by the coastal state, to carry observers. The carrying observers would need supporting international legal instruments such

⁴Observer programmes in many countries are advanced – by way of example see the report of “Program Review of the Northeast Fisheries Science Center Fisheries Sampling Branch” Steven J Kennelly, Matthew C Ives (IC Independent Consulting) March 2015.

as mention elsewhere in this report and include UNCLOS, the UN Fish Stocks Agreement (1995), Recognised conventions and RFMOs, National Legislation and Bilateral agreements

It is therefore imperative that national legislation is consistent with International law and the countries commitment to instruments to which they are signatories. In the East African and South West Indian Ocean context most coastal and island states are signatories to UNCLOS, have ratified the UN Fish Stocks agreement and have in place at different levels, legislation that relates to the use of observers. We stress again that scientific observers are primarily data collectors and generally have no direct compliance role. Countries in the region can nevertheless make the carrying of observers obligatory when issuing permits for vessels carrying their flag and fishing on the high seas (outside of EEZs and not under RFMO management).

At a national level, appropriate legislation is essential for the establishment of any observer programme. As for a coordinated regional observer programme, national legislation provides the mandate and authority to place observers on vessels or at field stations as needed. If this is not entrenched in the fisheries-related legislation then there can be no legal requirement for a vessels operator to take the risk of carrying an observer. Legislation protects both the observer and the client (vessel operator). In some cases observer requirements are loosely stated in the pertinent legislation, this might allow for flexibility in conditions related to observer deployments. On the other hand poorly defined legislation in this regard can result in rejection of an observer when boarding a vessel and offers no protection in terms of duties and conditions of the observer.

National legislation required to implement a national observer programme needs to stipulate at the very least the following:

- appointment and identification of observers;
- duties of observers;
- funding mechanisms or responsibility for payment of observer costs;
- notice of intention to place observers;
- responsibility of fishing vessel operator related to observer deployment;
- minimum conditions for observers on board vessels or at land-based locations;
- the protection of and duties to authorized persons (fisheries inspectors or observers)
 - Protection of authorized persons from liability;
 - Duties to authorized persons; and
- specify the penalties in place for contravening or failing to meet specified requirements in the legislation.

The licensing conditions and situations influencing observer deployments and coordination are determined by the nationality of the vessel and the area of operation. Three basic scenarios exist:

- a. National flagged vessels operating within their Exclusive Economic Zone (EEZ). These deployments often involve smaller vessels in the artisanal fishery that operate closer inshore. Trips may be short, one-day to a week depending on how the product is processed and preserved.
- b. National flagged vessels operating within the EEZ and on the high seas. A vessel operating on the high seas is expected to conform to the licence conditions imposed by the flagged state, as well as the conditions of the RFMO for the area. Vessels in these fisheries are often larger and undertake trips of several months.

- c. Foreign flagged vessels with permits issued to them by a country, allowing them to operate within their EEZ. These vessels may operate on both the high seas and within the countries EEZ. Depending on the size of the vessel and the sector in which they operate, trips can last up to several months.

6.3. Financial requirements

An important financial consideration for observer programmes is the user pays principle. In some cases costs for a NOP may be paid for by the state and funded indirectly through a special levy (tax) system on the fishing industry. Alternatively observer service providers have financial models that may be dependent on cost recovery and a profit margin i.e. running as a business. This is probably the best model as it involves competition between service providers whereas state-funded programmes have less rigorous and competitive budgeting. In some cases NGOs might fund an observer programme or alternately an industrial body (fishing association) might collectively fund a programme.

The most important aspect then of financing an observer programme is that it is self-sustaining. Many programmes are short-term and end because of inadequate financing. This is a waste as the capacity developed is lost and not easily recovered. Our advice then is that any observer programme should take a long-term view and ensure that the business model is adequate. At the start of a new observer programme therefore a financial analysis and business plan is essential. First the start-up costs need to be estimated and then the predicted annual operational costs. These costs will depend on many factors, including the type of management system being used and the scope and extent of the programme. For example, if the programme is implemented through a regional fisheries authority many of the potential costs may be hidden in the general budget for the organisation, including office accommodation, telephone bills and personal administration. Alternatively if a private or semi-private organisation administers the observer programme, all costs ranging for observer equipment, training, technology, insurance and salaries etc. need to be assessed, planned for and monitored.

6.4. Institutional arrangements and management

Institutional arrangements and management structures required for observer programmes will vary from country to country as well as in a regional context. Regionally different models might be applied and these will need to be, as far as possible, consistent with the systems used by participating countries but also with any RFMOs in the region. There are several different management systems and structures that a regional organisation might adopt. These could be:

- a. management staff and observers are all employed by the regional organisation and they function as an integrated part of that organisation;
- b. management staff are employed by the regional organisation and function as an integrated part of that organisation but observers are contracted to the programme either as individuals or outsourced to a professional observers service organisation;
- c. each participating country agrees on standards and protocols for observer deployments, training, observer payments, sharing of data etc. as well as deployment levels. A common data base is shared and countries collaborate to manage observers particularly with logistics. There is no central regional office although parties might agree on a location for sharing and communicating observer data and logistics.

No one system is inherently superior but there are advantages and disadvantages. Therefore when considering observer management system options and structures it is important to keep in mind the programme objectives.

Figure 14 shows a management structure for a typical regional fisheries observer programme that includes a national level for domestic deployments.

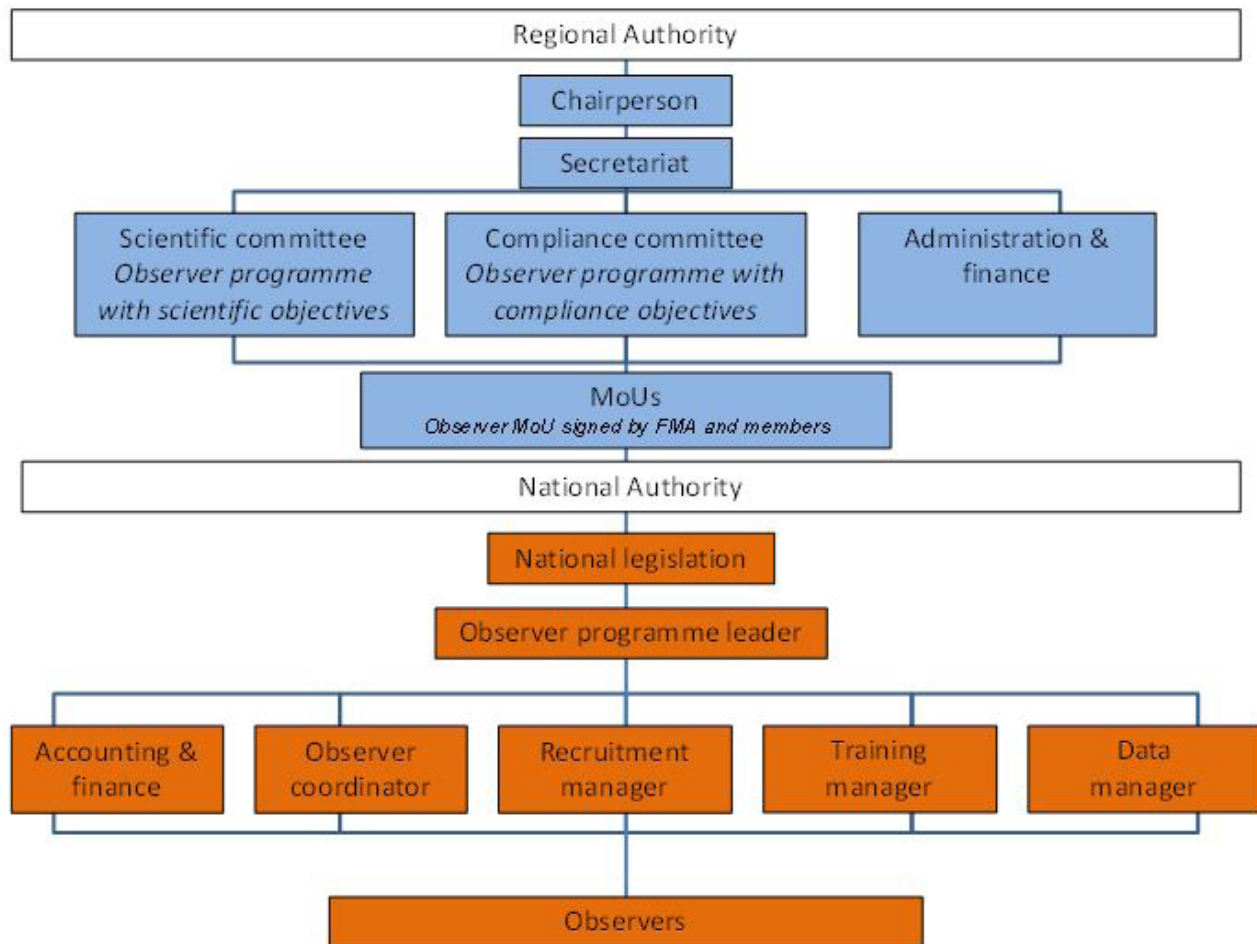


Figure 14: Example of a management structure for a regional observer programme also showing a national level management structure.

Management structures are determined by aspects such as the mandate, the number of staff and the staff classification and experience. Due to these factors, some staff members perform different tasks related to several departments. In the example shown in Figure 14, the chairperson and secretariat facilitates the work carried out by the regional organisation. The compliance committee monitors the observer programme with compliance objectives in accordance with conservation and management measures. The administration and finance advises on administrative and financial matters, in particular the operational budget for the current year and the provisional budget for the ensuing year. The scientific committee manages the observer programme with scientific objectives and provides advice on the status of stocks and the management actions necessary to ensure sustainability of the fishery.

At the national level, the programme is usually headed by a national programme leader that runs the entire programme.

6.5. Management and maintenance of the programme

Observer programme managers will always need to assure stakeholders that the programme remains sustainable. This will require a dynamic and flexible approach to allow the programme to adapt to challenging circumstances. This flexibility combined with correspondence, planning, target setting, annual review and feedback will help facilitate this process.

6.6. Monitoring and sampling strategies

Observer programmes are mostly designed to collect randomised data (without sampling bias) and summary information for fisheries management. Sampling strategies are based on the overall objective of the programme and vary from fishery to fishery, and for each observer programme. However, in preparing a sampling strategy for a given fishery there are several stages that should be considered;

- an evaluation of the baseline information available for each fishery;
- an assessment of whether 100% monitoring or only sub-sampling is appropriate for the fishery;
- an assessment of the operational requirements for the fisher(ies) and the programme as a whole;
- a strategic design in relation to vessels, fishing events and catch to be monitored based on the known characteristics of the fisheries under consideration;
- an implementation of a pilot study to validate sampling design and methods; and
- a feedback mechanism between the observer programme and the fisheries authority to ensure data satisfies the objectives.

6.7. Observer deployment logistics

Typically the deployment of observers requires a briefing meeting to agree on amongst other things data collection and logistics. Observer deployments are also followed by a “debriefing” and submission of reports.

Briefing meeting

A detailed briefing protocol and equipment checklist is essential for all deployments to prevent important items or issues being overlooked. Forgetting essential sampling equipment, such as scales or measuring boards can have a significant detrimental effect on the observer’s performance at sea. The briefing process should start well in advance of the expected deployment date to allow for the preparation of gear and to make travel arrangements where necessary.

The briefing meeting should include:

- Details of the trip logistics and travel arrangements (flights)
- Checking travel documents (i.e. passport, safety certificates)
- Details of the vessel and where possible the names of the Captain and Fishing Masters
- Overview of the programme, including its mandate and objectives
- Detailed sampling instructions
- Gear check lists
- Reporting protocols
- Health and safety procedures

Debriefing

The debriefing of the observer is the last logistical process of an observer’s deployment. Similar to the process of preparing the observer for the trip and facilitating their embarkation, the debriefing follows a process that includes:

- Administration for disembarkation and notification
- Gear return
- Review of preliminary report
- Data check
- Submission of the Trip Report

Note that briefing and debriefing of observers can often include not only observers but also vessel operators, state authorities and any other interested and affected parties that might have a direct interest in the work to be carried out.

6.8. Data/reporting outputs

Members of regional fisheries organisations have annual reporting obligations. These primarily incorporate catch and effort data and the submission of scientific reports. Such reports would also consolidate information collected by observers and also verify observer deployment commitments. Scientific and compliance data are therefore standard outputs of any observer programme. Sea-based data collection on commercial vessels allows for “dependent” data collection and verification of commercial activity. This is in contrast to “independent” data collection undertaken by non-commercial vessels (research surveys). Scientific data (catch weight, species composition, sex and maturity, number and length, water temperature) are collected to provide information useful for the scientific aspects of fisheries management e.g. total catch, CPUE, species, age and oceanographic condition, and which normally provide data for stock assessments that would not normally be available from research.

Compliance activities rely on the appropriate legislation being in place to establish the role and function of a compliance observer (inspector) and from which a strategy for observer activities can be developed. Compliance activities include for example the monitoring and validation of :

- skipper logbooks
- discarding and high grading information
- prohibited species and incidental catch
- undersized and spawning species
- the fishing areas and season restrictions
- fishing gear
- processed fish
- document checks
- sightings of other vessels
- transshipment at sea

At the end of a trip the observer normally has to write a detailed trip report. The cruise report is usually written in a prescribed format. The overall objects of these reports are to provide a summary of the observer’s activity and the data collected during the trip. The report also provides an opportunity to report information that is not routinely captured on the data forms of electronic logs. Observers can also explain data that has been captured that may be queried due to specific conditions, or the situation at the time.

6.9. Training and Recruitment

Without specially designed training an observer programme will suffer from unprofessional behaviour, poor data quality and lack of respect from the industry and other sections of the fisheries management authority. Training must therefore be considered the key element in establishing an observer programme and should be standardised between all participating countries.

Recruitment

The recruitment of potential candidates for observer training is recognised as a critical step for successful training, ensuring optimum pass rates and long-term retention of observers. Observer screening requires a formal administrative process but, as observers have a high degree of responsibility and independence at sea, occupying important “positions of trust”, background checks, interviews, and verification of references are critically important in the recruitment process. Only individuals with a specific skills set and relative work experience should be invited to apply for observer positions. These should include:

- minimum academic qualification of a school leaving certificate;
- proven literacy competence;
- proven mathematical competence to undertake statistical calculation of catch compositions and catch determination;
- ability to communicate in the language of the area;
- police clearance certificate (not always required);
- applicants must not have participated in any activity that would:
 - cause a reasonable person to question the impartiality or objectivity with which the observer programme is administered;
 - significantly impair the observer’s ability to perform his/her duties; and
 - adversely affect the efficient accomplishment of the programme’s objectives.

The following skills would be advantageous prior to the recruitment process. During the observers training however these skills should also be developed before the new recruit is deployed:

- basic marine species identification;
- basic knowledge of fish biology (length measurements, anatomy, sexing, maturity staging, otolith extraction, collection of stomach samples, collection of genetic material, etc);
- basic understanding of the need for random samples and the ability to correctly conduct random sub-sampling of catches;
- familiarity with, and the interpretation of information provided by the ship-board electronic equipment where pertinent;
- basic nautical knowledge;
- awareness of shipboard protocol;
- ethics with respect to validity and accuracy of data recorded and reported;
- seabird identification;
- good record keeping and specimen labelling;
- log keeping and basic report writing;
- ability to estimate total catch;
- familiarity with pertinent legislation
- familiarity with permit conditions;
- good inter-personnel and communication; and
- basic computer literacy.

Each candidate would first be interviewed and then be required to complete pre-recruitment assessment tests as part of the selection process. If successful, a police clearance certificate and a reference check should be conducted. The candidates' referees should be questioned about their work habits, ability to adapt and improvise, ability to work alone and complete work in a timely manner, physical fitness, capacity to live in potentially hostile environments, and their ability to maintain standards of conduct.

Declarations are required from the candidate indicating that they do not have direct financial interest with a rights holder or in the observed fishery that they will be monitoring, including, but not limited to, vessels or shore-side facilities involved in the catching or processing of the products of the fishery, companies selling supplies or services to those vessels or shore-side facilities, or companies purchasing raw or processed products from these vessels or shore-side facilities. The interests of a spouse or minor child of the observer should also be considered.

Training

A regional observer programme will only be possible if all observers meet the same level of competency standards (minimum requirement and training), share the same data collection objectives (compliance and scientific) and benefit from similar management action (briefing, work and sampling protocols, debriefing and reporting). A draft of the "African Union National and Regional Fisheries Observer Duties Manual (2016) Final" has been provided (submitted to AU-IBAR on the 03/04/2016) and will be cross referenced in this document.

The key aspect for building up of a team of observers is a standardized training curriculum. This action will also facilitate the harmonizing of national observer programmes across regions. A standardised or generic training curriculum is split into two main components;

1. in-house training, which is conducted by the intuition(s) managing/supporting the observer programme; and
2. out-sourced training, which is conducted by specialised organisations/consultants.

In addition, observers are encouraged to improve their qualifications with additional vocational training.

Generic in-house training

The in-house training has two training phases. The first phase is the theoretical and practical training. The second phase (or refresh training phase) follows when observers have gained experience in all the fishing sectors, and revises the initial theoretical instruction and takes into consideration this practical experience that the observers had gained. The theoretical phase includes content such as basic knowledge of vessel terminology, fishing techniques and fishing gear covered. An introduction into navigation and meteorology is included to facilitate capturing positional data and recording environmental interactions. At the completion of the first phase of their training the trainee is expected to be able to recognise and understand the function of the fishing gear being deployed in the primary fishing sectors. They must be able to identify the main species caught for each sector and be able to sample for catch composition and length frequency and be able to record the information on the relevant data sheets. The training course also includes a module on professional communication and conflict resolution to guide the observer when faced with possible conflict situations. This is emphasised with practical role-play in the class setting.

There should be a practical component to the training, which covers species identification and determining catch composition from wet fish samples. The practical setting up, zeroing and reading a spring and electronic scales and correct method of measuring and recording length frequencies is included. Understanding and the correct method of completing data sheets is important part of this training.

Practical training tasks and assignments in the first phase of training include:

- species identification;
- determining catch composition from statistical sampling;
- the use of sampling equipment. Measuring boards and scales;
- recording information onto data sheets.

The first phase also covers observer administration for deployment and protocols and health and safety aspects pertaining to daily work onboard a vessel. It includes a broad overview of the fisheries and the observer requirements for each of these. Technically it provides generic instruction on sampling techniques, species identification, data capture and reporting. Health and safety is a critical component of observer training and will be included in this section.

This phase of training usually takes five to ten days to complete. Theoretical subjects are covered by lectures using visual aids (presentations, video and photographic learning aids) are also used effectively to train observers in the basics of the sector (gear, area of operation, value etc.) and for basic fisheries science biology and calculations (such as how to determine catch composition). The practical workshop sessions are used for the practical components such as sampling techniques and data entry. A more detailed outline of the training programme is available in Appendix 2.

The second phase of generic training follows when observers have gained practical sea experience. Experience by the company in observer training has shown that at this stage new observers can understand better both the theoretical and practical implications of working at sea. This training revises the initial theoretical instruction and takes into consideration the practical knowledge they have gained. It also allows for including new material and places emphasis on accurate data collection methods, additional biological sampling strategies and species identification for different sectors.

Regular assessment of candidates and observers is conducted during and after training courses. Trip briefing and debriefing after the first trip is an essential part of the on-going training process. This provides the means to identify strengths and weaknesses in each observer, and if additional training is required on any one or more components. Candidates are assessed at the end of the initial training course through a theoretical examination and practical exercises and have to demonstrate a specified level of competence in all of the main outcomes to receive certification.

Once trained, observers are expected to attend regular briefings and on-going training workshops to keep them up-to-date with revisions in sampling and data collection requirements and any changes to sectors' permit conditions. In addition, observers should improve their qualifications with additional vocational training.

Out-sourced training

Out-sourced training is divided into two categories:

1. Compulsory safety training to meet national and international health and safety requirements
2. Recommended training that will assist the observer both in the event of emergencies and in the professional execution of their duties.

These training components are outsourced to accredited organisations conforming to “The International Convention on Standards of Training, Certification and Watch-keeping for Seafarers (STCW95).

Subjects that are outsourced are;

- Personal Survival Techniques (PST);
- Practical First Aid;
- Marine Fire Fighting; and
- Global Marine Distress and Safety Systems (GMDSS).

Personal Survival Techniques (PST) and Basic Sea Survival, Familiarization and Personal Safety and Social Responsibility Training (STCW95 A-VI/I-1; A-VI/I-4 & A-VI/I) are compulsory training requirements for observers to be allowed to embark onto a vessel, and prepare them to react to emergency situations where there is an imminent danger to flooding, fire or having to abandon the vessel at sea. This training includes instruction on:

- introduction to safety and survival at sea;
- emergency situations;
- survival craft and rescue boats;
- personal life saving appliances;
- evacuation and survival at sea; and
- helicopter rescue.

It is recommended that observers operating on the high seas also complete a first aid course to “level one” that includes a competency certificate in First Aid and CPR training, (STCW95 compliant).

Optional training components that will augment the professionalism of the observer include:

- Fire Fighting; -This course is intended to give all candidates basic knowledge of fire safety, fire prevention and an understanding of the hazards of fire. Candidates will understand the need for prompt, safe and correct action to be taken on the outbreak of a fire including the use of basic breathing apparatus and the use of extinguishers on live fires;
- Radio Telephone Communication Certificate; this course provides the observer with certificate for operating the basic radio equipment found onboard all South African vessels. It covers emergency radio procedures and radio protocol
- Electronic Navigational Systems (ENS); this course provides a comprehensive understanding of all electronic navigation systems that an observer is likely to encounter onboard. It will provide the knowledge to record accurate positional information in different circumstances.
- Training in Global Maritime Distress and Safety System (GMDSS), provides the communication support needed to implement search and rescue in emergency situations and will assist the observer in the operational aspects of the advanced satellite communication systems that are now compulsory on all vessels operating on the high seas. This training assists in the sending

and receiving communications while onboard and can overcome communication issues when language differences exist.

6.10. Remuneration systems and contracting

A remuneration system for an observer programme is normally based on an “observer day”. A full observer day is defined as the days that the observer is present on board the fishing vessel starting from a point of departure (port or point from which they leave home base) and thereafter arriving at port and discharge. Travel days, stand-by days and report writing days are at the discretion of the organisation. In some cases observers are paid full rates “door to door” while other organisations might only charge full rates once the observer is on the vessel and all standby and travel days might for example be charged at 50% of the agreed sea-day rates.

The administration process should include the following:

- Observer contracts of employment and salaries
- Insurance and liability cover
- Managing leave and time-off
- Logistics
- Observer well-being
- Medical fitness
- Drug and alcohol testing
- Updating of basic requirements and certificates

Contracts of employment and salaries

Observers should be offered contracts of employment that can be either a fixed salary or an ad hoc contract for each trip working on an observer day rate. These contracts should typically specify:

- Salaries and observer day rates,
- Compliance to labour regulations with respect to leave and taxes,
- The observer’s job description,
- Disciplinary action for non-performance,
- Conditions for the deployment and the maintaining observer protocols,
- Observer confidentiality and
- Personal accident and injury insurance.

Insurance

During the time that observers are on contract, they should be insured for personal accident and injury in the workplace. International fishing is considered as one of the occupations with the highest risk to personal accident and injury. Due to these high risks and costs of the insurance and possible high claims, it is advisable to get professional legal advice when drawing up these clauses in a contract.

Observer leave

Observers on fixed salaries have prescribed leave for time worked. In some cases it may be necessary to include additional leave based on time spent at sea. While at sea, observers are effectively working a full seven days a week. During this time, they are unable to manage many aspects of their personal life. Following an extended trip, it is common practice to allocate additional leave to the observer based on the number of days spent at sea, before expecting them to continue with their daily land based work routine. For example: “one-day-off for every seven sea-days”.

Observers that work on ad hoc contracts usually have breaks where they are off-contract, which is effectively their own time. Observer logistics coordinators must avoid using ad hoc observers on consecutive long assignments without giving them sufficient time off between trips. Observers working on this basis often accept the work, regardless of the interval between trips as they are dependant solely on the income from their days at sea. However, continuous time at sea, under the strenuous working conditions, can have a detrimental physiological effect which can influence both the quality of their work and their impartiality. This is especially the case if they are deployed onboard the same vessel on consecutive trips. It may be necessary to come to an agreement with the observers to determine a minimum break between trips.

Appendix 1. Pertinent South African legislation relating to observers

Marine Living Resources Act (1998) – Chapter 6: Law Enforcement

Observers

50

1. The Director-General may designate a person in writing to act as an observer on vessels issued with fishing licences in terms of this Act and shall furnish such an observer with the prescribed identity card.
2. An observer may be designated in accordance with the terms of an agreement contemplated in section 38.
3. Any person designated in accordance with subsection (2) who is not a citizen of the Republic shall, while in South African waters, be subject to the provisions of this Act for the purposes of carrying out his or her duties and enforcing his or her rights.
4. An observer shall exercise the scientific, compliance, monitoring and other functions determined by the Minister.
5. Any person on board any vessel issued with a licence or permit shall permit any observer to board and remain on such vessel for the purposes of performing his or her functions.

Appendix 2. Pertinent Namibian legislation relating to observers

Marine Resource Act No 27, 2000 – Part III: Officers

Fisheries observers

7.

1. There shall be fisheries observers who shall be appointed by the agency to-
 - a. observe the harvesting, handling, and processing of marine resources and related operations and to record data concerning such operations;
 - b. collect and record biological and other information related to activities governed by this Act;
 - c. collect samples of marine resources harvested;
 - d. report to the agency any observations and information obtained under this subsection; and
 - e. perform such other activities as may be agreed upon between the Minister and the agency, but not inconsistent with paragraphs (a) to (d).
2. The Minister may require a person harvesting marine resources, under a right, an exploratory right or a fisheries agreement to
 - a. carry a fisheries observer aboard any fishing vessel;
 - b. admit a fisheries observer to any land and any premises used for harvesting marine resources;
 - c. allow the fisheries observer referred to in paragraphs (a) and (b) access to all parts of the fishing vessel, land and premises as well as to any records, documents and marine resources found there;
 - d. provide reasonable accommodation for the fisheries observer referred to in paragraphs (a) and (b); and
 - e. allow the fisheries observer referred to in paragraphs (a) and (b) the use of all equipment necessary for the performance of his or her functions.

Appendix 3. Pertinent Angolan legislation relating to observers

Law No. 6-A/04 on Aquatic Biological Resources (new Fishing Act).

Chapter IV. Section II. Article 138 - The functions of a Scientific Observer

1. The observer conduct, as part of duly approved research projects , data collection related to the activities on board fishing vessel , particularly as regards fishing gear used , fishing areas , number and kind of catch , biological sampling of catches and environmental factors.
2. The observer can not, perform any other activities on board the fishing vessel other than those referred to above.

Article 139 - Obligations of the Scientific Observer

- a. identify themselves as scientific observer the captain of the fishing vessel at the time of entry on board;
- b. respect on board discipline as defined by the captain of the fishing vessel;
- c. keep to a minimum interference with the normal course of fishing activities during their stay on board;
- d. provide all information gathered by the competent Ministry under the conditions prescribed by regulation.

Article 141 - Captain Bonds

In the case of scientific research aboard the fishing vessel, the captain of the fishing vessel shall:

- a. allow the entry and stay on board the scientific observer designated to accompany a defined fishing;
- b. facilitate the entry on board equipment and other materials required for conducting the activities of the scientific observer ;
- c. provide food, accommodation and medical assistance equivalent scientific observer to those provided to officials of the crew of the vessel;
- d. facilitate access to all areas , instruments, samples and information relevant to the performance of the activities of the scientific observer ;
- e. where appropriate , facilitate the transfer safely the observer of a fishing vessel to another.

Chapter V. Section I. Article 142 – Monitoring objectives

Monitoring aims at gathering information necessary for planning fisheries related activities and aquaculture, to ensure compliance with the provisions of this Act and its regulations.

The information referred to in the preceding paragraph shall in particular:

- a. the number of fishing vessels by area, type of fishing and vessel;
- b. the characteristics and selectivity of fishing gear;
- c. the means of technological support or fishing navigation and its efficiency;
- d. seasonal changes in fishing effort and fisheries;
- e. the location of fishing fleets in relation to the other;
- f. the historical evolution of catches and fishing effort by fishery;
- g. the catch composition by fishery by size and other biological characteristics;
- h. the amount, species composition and biological characteristics of the catches and rejected;
- i. the ability of fish processing establishments and their fish supply needs;

- j. the environmental, economic and social impacts of management measures, in particular on fishing effort;
- k. The fishing offenses committed at certain times, in certain fisheries, fishing areas, types of fishing and craft classes

Monitoring means:

1. Monitoring can be exercised by land, water, air and satellite, for all activities under this law.
2. In the monitoring of fishing and related activities, the competent Ministry may use, among others, the following instruments:
 - a. the fishing logbook ;
 - b. the book monthly information ;
 - c. the programme of fisheries observers;
 - d. the programme of Community observers ;
 - e. the continuous monitoring equipment.

Article 144 - Government bonds

1. The State, through the competent Ministry, should undertake the collection of information required for the planning of fisheries, aquaculture and related activities through:
 - a. promotion of Community observer programmes and fishing;
 - b. organization and updating of records of fishing rights holders and fishing vessels;
 - c. ensuring the smooth functioning of the continuous monitoring system;
 - d. examination of the documents referred to in Article 145;
 - e. promoting regular inspection programs of activities referred to in this article;
 - f. adequate training of all those whose function is the provision, collection and processing of the information provided in this chapter, including officials of the competent Ministry, fishing rights owners, captains and crew members of fishing vessels and Community observers;
 - g. consultation of the stakeholders, in particular non-governmental organizations representing the fishing rights holders on the means and methods of monitoring.
2. They are also government bonds, through the competent Ministry:
 - a. to process in statistical particular of the information collected under this law and other applicable laws;
 - b. provide fishing rights holders, where appropriate, the relevant information for the fulfilment of its obligations to provide information;
 - c. guarantee the confidentiality of data and information collected, where applicable; 67
 - d. transmit the information obtained from the monitoring to the competent public institutions;
 - e. transmitting the information from the monitoring to international organizations under the Convention and other international instruments binding the Angolan State;
 - f. ensure access of stakeholders, especially the fishing rights holders, information obtained from monitoring under the legislation in force;
 - g. ensure the dissemination of information of public interest, in particular on the status of aquatic biological resources or certain areas as well as fishery and aquaculture products;
 - h. cooperate with other states in monitoring of shared resources and migratory species.

Section II. Article 152 - Functions of the Community Observer

1. The functions of Community observer :

- a. collect biological samples and data on fisheries , including catches, in areas reserved referred to Articles 78 and following ;
- b. collecting exercise tests of the industrial fishing activities and semi -industrial fishing in the reserved areas;
- c. inform the competent authorities any offense under this Act and its regulations brought to their knowledge .

Article 153 - Rights of the Community Observer)

1. Community observer is identified by presenting their ID card issued by the Ministry.
2. Community observer can use the necessary means to perform its functions, including binoculars, cameras and video recording, manual GPS , radio and mobile phones.
3. The competent ministry should provide the Community observer with the necessary means to perform its functions as well as adequate training.

Appendix 4. Pertinent Mozambican legislation relating to observers

In the area of administration and security in sea waters, rivers and lakes:

- Apply and ensure compliance with national legislation and international conventions relating to maritime affairs that the country has ratified;
- Ensure the sustainable exploitation of sea waters, rivers and lakes for the development of fisheries and aquaculture;
- License, accredit and proceed to the recognition of companies categorised as shipping and maritime companies, in coordination with other relevant entities;
- License, monitor and supervise the research activities at sea and inland waters, in coordination with other organs or relevant entities;

In the area of administration and management of fisheries:

- Propose the definition of policies and strategies for the responsible and sustainable development of fisheries;
- Ensure the sustainable management, conservation and exploitation of biological aquatic resources and establish mechanisms for monitoring and control of fishing activities;
- Manage the fishing operations carried out either both in sea waters and inland waters under national jurisdiction, in accordance with the territorial planning and legislation;
- Promote and support institutional forms of involvement of fishing communities, economic agents and other actors in the participatory management of fisheries resources;
- Regulatory Framework, license and monitor the exploitation of fishing resources.

In the area of scientific research:

- Propose the definition of policies and strategies geared to the development of the scientific and technological bases of knowledge of sea waters, rivers and lakes, as well as their ecosystems;
- Investigate fishing resources and promote the development of the scientific and technological bases of knowledge on these resources, as well as to disseminate the information obtained;
- Promote the coordination and development of scientific research activities of biological aquatic resources with a view to ensuring awareness, access, exploiting their monitoring;
- Perform research and evaluation trips, including exploration of new fishing grounds;
- Promote the coordination of research activities aimed at the conservation and restoration of the natural environment and its resources in the aquatic environment;



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