

MINISTRY OF FISHERIES AND MARINE RESOURCES





Our mission:

To strengthen Namibia's position as a leading fish producing nation and contribute towards the achievement of our economic, social and conservation goals for the benefit of all Namibians

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LIST OF ABBREVIATIONS USED IN THE DOCUMENT

BCLME	Benguela Current Large Marine Ecosystem Programme
BENEFIT	Benguela Environment Fisheries Interaction and Training Programme
CCAMLR	Commission for the Conservation of Antarctic Marine Living Resources
CSIR	Council for Scientific and Industrial Research (South Africa)
DFID	Department for International Development
EEZ	Exclusive Economic Zone
EU	European Union
FAO	Food and Agricultural Organisation
FOA	Fisheries Observer Agency
GDP	Gross Domestic Product
GEF	Global Environmental Fund
HAB	Harmful Algal Bloom
ICCAT	International Commission for the Conservation of Atlantic Tunas
IAC	Inland Aquaculture Centre
ICEIDA	Icelandic International Development Agency
ICT	Information and Communication Technology
INFOPECHE	Intergovernmental Organisation for Fishery Information and Co-operation Services for Fishery Products in Africa
Km	Kilometre
MCS	Monitoring, Control and Surveillance
MFMR	Ministry of Fisheries and Marine Resources
N\$	Namibian dollar
n. mile	Nautical mile
NAMFI	Namibian Maritime and Fisheries Institute
NatMIRC	National Marine Information and Research Centre
NORAD	Norwegian Agency for Development Cooperation
NPC	National Planning Commission
PV	Patrol Vessel
RV	Research Vessel
SADC	Southern African Development Community
SAMSS	Southern African Marine Science Symposium
SEAFO	South East Atlantic Fisheries Organisation
STCW	Standard of Training and Certification of Watchkeeping
TAC	Total Allowable Catch
UNDP	United Nation Development Programme
VMS	Vessel Monitoring System

FOREWORD

It is my great pleasure to present the 2005 Annual Report of the Ministry of Fisheries and Marine Resources. As a preferred supplier of management services, the Ministry is guided by its Customer Charter, which sets out standards of efficiency and excellence in the delivery of its services. I am therefore honoured to renew my Ministry's commitment to managing our fisheries and aquaculture for development results, in line with our business Strategic Plan (2004 – 2008) and the Aquaculture Strategic Plan (2005 -2009).

The year 2005 presented challenges and opportunities for the marine commercial fishing and processing sector, yet the busiest in setting momentum for advances in aquaculture development countrywide. Among the challenges experienced by the marine capture fisheries sector is the high preponderance of juvenile fish, particularly in the bottom-trawl fishery for hake. This management challenge presents opportunity for future management measures in favour of protection of the juveniles. Furthermore, the rise in the price of crude oil and the appreciation of the domestic currency were not the most favourable to the marine resources sector. Despite these challenges, the fishing industry could land 552 thousand tonnes, only about 3% less than the level realized during the previous year, with a final value of some N\$3.8 billion.

Research on the state of the commercial fish stocks and environment remains a repository of scientific advice on which our resource management is premised. Oceanographic research and monitoring programs undertaken during the year indicated normal sea-surface temperatures and dissolved oxygen levels. To these dynamics of our Benguella current upwelling system shall be added land-based and sea-surveillance activities, which continue to prevent and deter illegal fishing from our waters.

During the period under review, the Ministry accelerated the expansion of aquaculture activities countrywide. This includes expansion of water quality monitoring and sampling programs and increased fingerling production. Furthermore, an Aquaculture Business Conference was held in February. However, the potential for aquaculture to make a dent in rural poverty and realize increased export earnings is still to be fulfilled. Access to technology and financial resources remain key constraints and the government is still seized with establishing sanitation programs for product quality assurance.

Namibia continued her active participation in international fisheries affairs through our membership to various regional and international fisheries organizations. Namibia hosts the South East Atlantic Fisheries Organisation (SEAFO) Secretariat and we were privileged to host the 2nd Meeting of SEAFO in October in Windhoek.

The progress realized by the Ministry during the year is due to the commitment and diligence of our personnel. I wish to express my deep appreciation and gratitude to all staff members and stakeholders for their support and commitment during this period.

DR. ABRAHAM IYAMBO
MINISTER

1 THE MINISTRY OF FISHERIES AND MARINE RESOURCES

The Ministry of Fisheries and Marine Resources is responsible for the management and development of capture fisheries and aquaculture.

1.1 OBJECTIVES

The overall objectives of the Ministry are derived from the Mission Statement. Our objectives are to:

- Promote and regulate the responsible and sustainable utilization of living marine and freshwater resources and aquaculture within the context of environmental sustainability.
- Establish a conducive environment in which the fishing and fish processing industries can prosper and derive optimal income from marine resources.
- Further Namibia's interests within the international fishing sector.
- Provide professional, responsive and customer-focused services.
- Deliver our services efficiently and effectively providing best value for money.
- Continuously invest in human resource development so as to enhance Namibia's capacity to manage fisheries and marine resources, develop and participate in domestic fishing and fish processing, and play an effective role in regional and international fisheries affairs.

1.2 ORGANIZATIONAL STRUCTURE

The Office of the Permanent Secretary provides executive management to four directorates within the Ministry namely: the Directorate of Resource Management, responsible for scientific research and advice, the Directorate of Operations and Surveillance, responsible for monitoring, control and surveillance, the Directorate of Policy Planning and Economics, responsible to coordinate the MFMR planning activities, as well as formulating fisheries policies and legislation and undertake research and advise on the socio-economic issues, finally the Directorate of Aquaculture, responsible for the administration and development of aquaculture. A General Services Division provides administration and support services.

Directorate of Operations

Main responsibilities:

- Regulating fishing activities within the Namibian EEZ.
- Monitoring, control and surveillance activities both at sea and onshore through the operation of fisheries patrol vessels, cars for coastal inspection and fisheries patrol aircraft by Fisheries Inspectors.
- Fisheries legislation enforcement.

Directorate of Resource Management

Main responsibilities:

- Provides advice on the state of commercially important marine fish stocks and recommendations on their appropriate yields;
- Appropriate management measures in relation to species and fish size limitations, closed seasons, closed areas, and limitations on the types and effectiveness of fishing gear.
- It is also responsible for research on fresh water fish resources in the interior of Namibia and provides advice on the conservation and management of those resources.

Directorate of Policy, Planning and Economics

Main responsibilities:

- Co-ordinates the formulation and implementation of fisheries policies and legislation.
- Carries out continuous policy and economic research and analyses.
- Responsible for the management of information services of the Ministry
- Administration of fishing rights and quotas
- Collection of fees
- Analysis and publication of fisheries statistics.
- Co-ordinates overall planning of the Ministry.

Directorate of Aquaculture

Main responsibilities:

- Ensure the responsible and sustainable development of aquaculture to achieve socio-economic benefits and environmental sustainability.
- Facilitate an efficient, coordinated administrative and institutional framework for aquaculture.
- Ensure that the genetic diversity and integrity of the aquatic ecosystem is maintained.
- Promote responsible aquaculture production practices.

1.3 MINISTRY'S STRATEGIC PLAN AND CUSTOMER CHARTER

The Strategic Plan (2004 – 2008) is guiding the MFMR in delivering services to the public. The Plan provides a framework of objectives, strategies and intended tasks against which the Ministry can be held accountable.

The Ministry's Customer Service Charter (2000) was reviewed during 2005 in order to incorporate aquaculture. In addition, MFMR also appointed regional representative to attend to complaints in their respective regions. .

During 2005 the Ministry participated in an international conference under a theme "Implementing the charter and related initiatives for public services in Africa". The purpose of the conference discussed emerging issues in the public service sector with a view to improve service delivery, training and resources utilization.

Both the Strategic Plan and Customer Charter can be access via the Ministry website.

4 FINANCE

The operations of the Ministry are financed through the Operational Budget for all recurrent expenditure and the Development Budget for capital projects. The operational budget for 2005/2006 was N\$96,142,000. The breakdown is indicated in Table 1.

Table 1 Operational Budget for 2005/2006

Budget Allocation	Estimate (N\$ 000)
Office of the Minister	1,964,000
Administration	8,992,000
Resource Management	20,369,000
Operations and Surveillance	53,713,000
Aquaculture	3,444,000
Policy Planning and Economics	7,660,000
Total	96,142,000

Source: MFMR 2005

The development budget for 2005/2006 was N\$22,000,000. Six capital projects were identified for funding as shown in Table 2.

Table 2 Development Budget for 2005/06

Ongoing projects	Estimate (N\$ 000)
Construction of Fresh Research Institute Centre Kamutjonga	7,000
Acquisition of Patrol Aircraft	9,600
Traditional Fishing Development	500
Aquaculture Development Project at Olushandja Dam/Onavivi	4,000
Aquaculture Development Project at Kavango	400
Aquaculture Development Project at Caprivi	500
Total	22,000

Source: MFMR 2005

In addition to the budget provided by Government, the Ministry received technical and financial assistance from Donor countries and organizations during the reporting year. The main areas of donor support are indicated in Table 3.

Table 3 Donor assistance received during 2005.

Donor	Type of assistance provided
Norwegian Agency for Development Co-operation	Support to review the MFMR Economic Model Database.
Icelandic International Development Agency	Provided technical assistance for review of Economic Model database.
European Union	Support to NAMFI with equipment (including computers and vehicles) and renovation of the building.
Regional Government of the Xunta de Galicia	Financial support for Henties Bay Fishermen's Cooperative; technical and financial assistance on aquaculture development projects (Omahenene/Onavivi); technical assistance to NAMFI; staff training in Spain.
Government of Malawi	Technical assistance (aquaculture development projects).
Government of Cuba	Technical assistance (aquaculture development projects).
Department for International Development (DFID)	Capacity Building for Trade in Fish

2 POLICY AND LEGISLATIVE FRAMEWORK

2.1 MARINE CAPTURE FISHERIES

Policy and Legal framework

A policy document titled *Marine Resources Policy: Towards Responsible Development and Management of the Marine Resources Sector* is available on the Ministry's web-site. The Legislation governing the marine capture sector includes: Territorial Sea and Exclusive Economic Zone of Namibia Act (1990); and Marine Resources Act (Act No 27 of 2000).

2.2 INLAND CAPTURE FISHERIES

Policy and Legal framework

Inland Fisheries Policy is outlined in the *White Paper on the Responsible Management of the Inland Fisheries of Namibia (1995)*, which allows the exploitation of inland fish resources on a sustainable basis. The Inland Fisheries Resources Act (No.1 of 2003) governs inland fisheries.

3 AQUACULTURE

Policy and Legal framework

The listed documents below are in place, ensuring that the development of Aquaculture in Namibia.

- Aquaculture Policy of 2001
- Aquaculture Act (No.18 of 2002)
- Aquaculture Licensing Regulations
- Aquaculture Strategic Plan

4 INFORMATION COMMUNICATION TECHNOLOGY (ICT)

The Ministry continues to expand its Information Communication Technology infrastructure hardware and software in support of MFMR objectives to make information accessible. ICT has also been extended to all MFMR regional office including small regional offices such as Oshakati, Arandis and Henties Bay.

The Fisheries Information Management System (FIMS) and The Fisheries Economic Database has been integrated with the purpose to enhance systems efficiency and compatibilities in various data sets. The SADC-MCS program that supports coastal law enforcement activities has already started with the development of a database.

2 FISHERIES RESEARCH

3.1 MARINE CAPTURE FISHERIES RESEARCH



The Ministry continued to conduct annual scientific research aimed at quantification of the resources and the state of the environment.

A demersal survey for hake was conducted with a Namibian fishing vessel. The vessel is fitted with gear similar to that of the *Fridtjof Nansen* (a Norwegian Research Vessel used for survey since 1991) to ensure that results from surveys undertaken with the two vessels are comparable. Horse mackerel, crab and monk were surveyed by the RV *Welwitschia* (Namibian Research Vessel). In the case of

small pelagic species (pilchard) the RV *Welwitschia* did the survey and commercial vessels were used for scouting purposes as in previous years. The Fishing Vessel *Conbaroya Cuarto* was used in surveying the orange roughy resource, while the RV *Welwitschia* was used for collecting the oceanographic data. Total Allowable Catch (TAC) recommendations were presented to the Marine Resources Advisory Council regarding all TAC-controlled commercial species.

Co-operation and sharing of expertise between scientists of Angola, South Africa, Germany and Norway was remarkable through BCLME, BENEFIT and the NANSEN programmes. BENEFIT provided training and research opportunities for both scientists and technicians within the region. Other research vessels, such as RV *Dr Fridtjof Nansen*, continue to provide valuable ship time for research for the Ministry.

2 STATE OF THE MARINE ENVIRONMENT

The Benguela Current is a very dynamic system and its variability is clearly reflected in the various time series illustrated below. However, no major environmental anomalies such as Benguela Niños or major low oxygen events have been detected in 2005.

Several environmental monitoring surveys were conducted in 2005 to collect information on the important oceanographic parameter that covers a large area of the Namibian shelf. Additionally, remotely sensed data on wind speed and direction, air temperature, sea surface temperature and chlorophyll-a has also been collected from weather stations and satellites. This information is analyzed and processed into regular updates on the status of the marine environment.

Wind: An analysis of the long-shore wind speed trends from 1960 to date (Figure 1) indicate that during the past year coastal upwelling in the Lüderitz region has been lower than average, a trend which has been sustained since early 1999. Data points shown on the graph below are annual averages and data from the most recent months were closer to the long-term average.

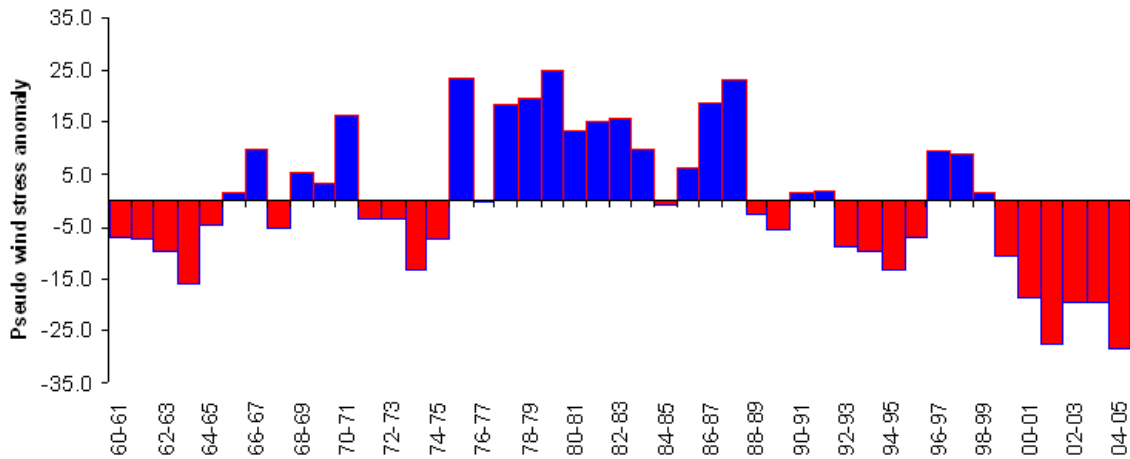


Figure 1 Annual longshore wind anomalies recorded at Diaz Point, Lüderitz – blue indicates stronger than average southerly winds and red indicates below average winds.

Sea surface temperature: No major sea surface temperature anomalies were detected during 2005 over the Namibian shelf region (Figure2). However, off Angola, the first half of 2005 was marked by two anomalous periods; firstly a warm period from November 2004 to April 2005 (*indicated in red in the figure below*) followed by a major cool anomaly from May to September 2005 (*indicated in blue*). Although these events were mainly confined to the Angolan shelf area the cool anomaly did extend into the northern half of the Namibian shelf as illustrated in the figure.

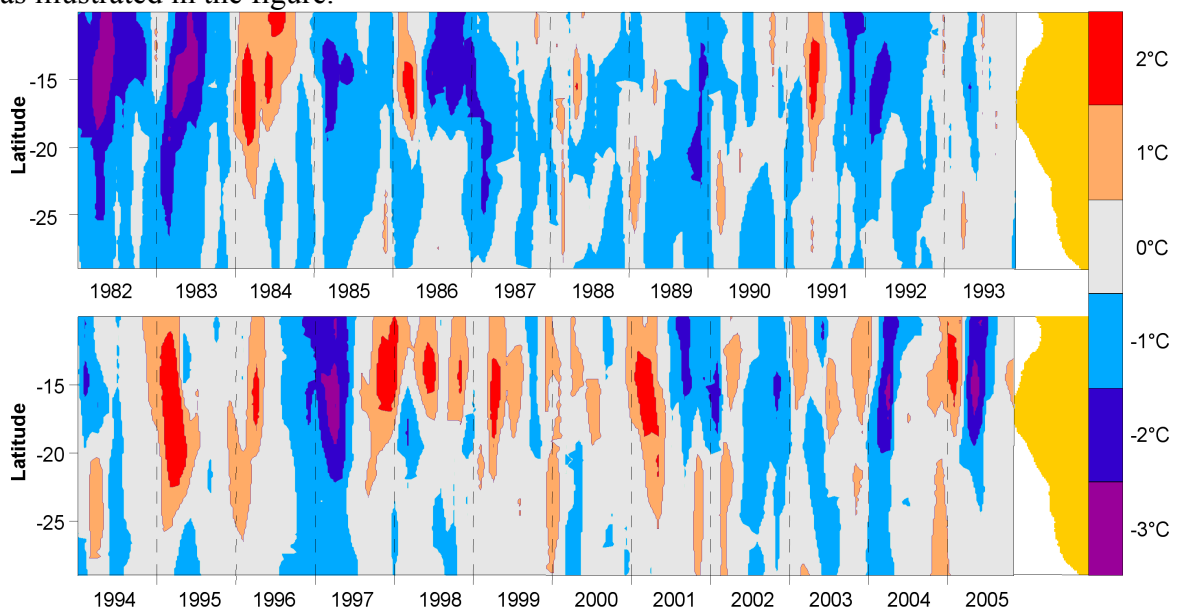


Figure 2 Monthly SST anomalies along the Angolan and Namibian coastline since January 1982.

Oxygen: Dissolved oxygen is one of the key environmental variables influencing the habitat suitability in biologically productive systems such as the northern Benguela. Oxygen status in the water column could be a limiting factor to successful habitat conditions for certain benthic and demersal species as well as pelagic egg and larval stages of various fish species. Dissolved oxygen levels over the central Namibian shelf were low during the first half of 2005, but increased after the winter/spring upwelling period to similar levels experienced during the second (Figure 3).

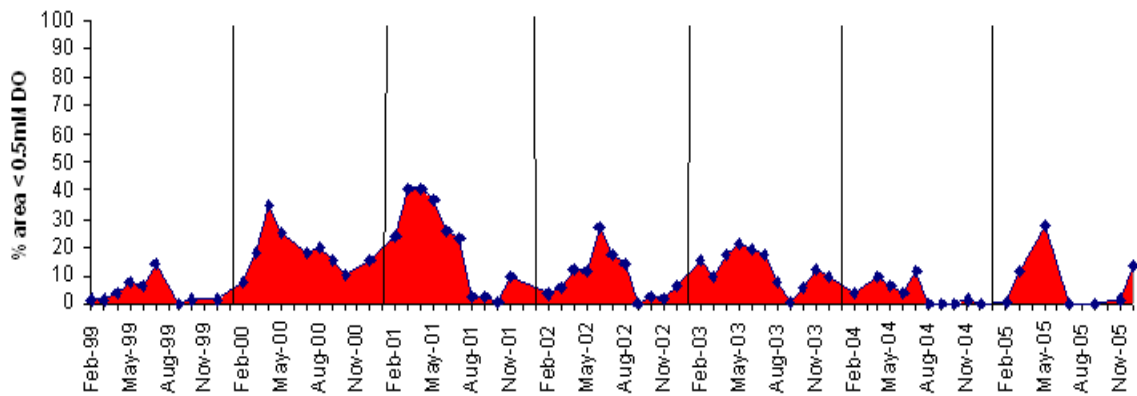


Figure 3Percentage areas of low oxygen water (≤ 0.5 ml/l oxygen) on the shelf off central Namibia, Walvis Bay.

Phytoplankton: A monthly chlorophyll-a index, representing phytoplankton concentrations along the Angolan and Namibian coast, has been derived from Sea WIFS satellite images. Highest chlorophyll-a concentrations usually occur off central Namibia, which is located downstream of the very intense Lüderitz upwelling cell. Low chlorophyll-a areas are usually found off this strong upwelling cell due to high water turbulence (*indicated with blue in figure below*) and off northern Namibia during intrusions of nutrient poor Angolan water, usually from December to March (*indicate by the red arrows*). During the 2005 season phytoplankton distributions extended over a wide area along the coasts of Angola and Namibia, but fewer dense concentrations were observed if compared with previous years. Additional information on chlorophyll-a, particle size and phytoplankton species composition has been collected on all Environmental-monitoring surveys to complement the satellite-derived data sets.

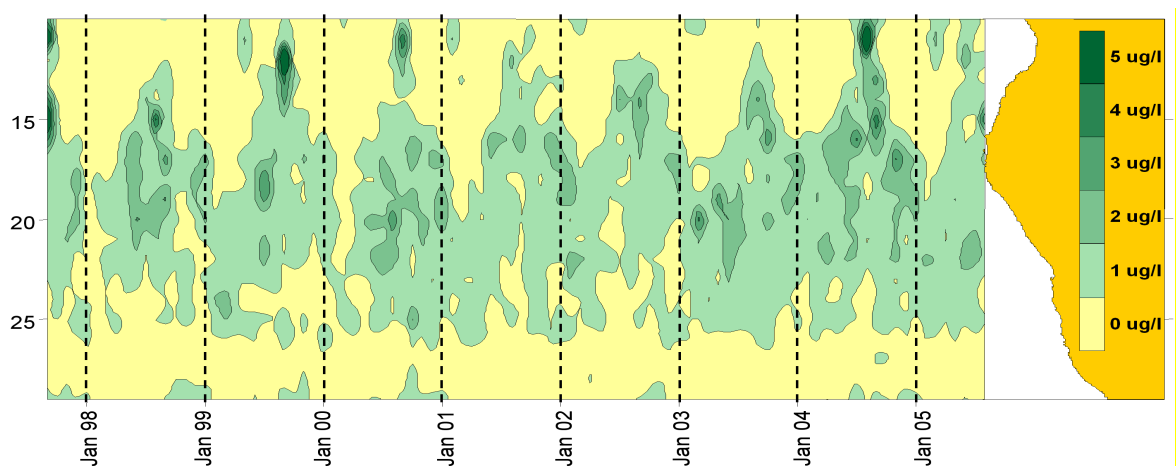
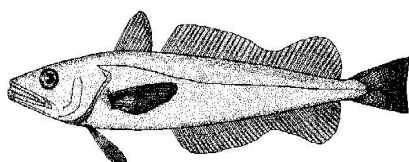


Figure 4 Time series of chlorophyll-a concentration along the southern Angolan and Namibian coastlines since September 1997. The blue encircled area indicates the high turbulent Lüderitz upwelling centre

Zooplankton: Copepod abundance on the 23°S transects, off central Namibia, provides an excellent proxy of secondary production and 2005 levels lower than during the previous years but similar to those measured in 2000. The Continuous Underway Fish Egg Sampler (CUFES) has been successfully installed on the RV Welwitchia and is operated during regular environmental monitoring surveys and other cruises of opportunity to map the spawning areas of sardine and anchovy. During the most recent survey (first week of December) sardine eggs were found in several small patches between 20°S and 22°S.

3 STATE OF MARINE RESOURCES

Hake



Biomass estimation and geographical distribution:

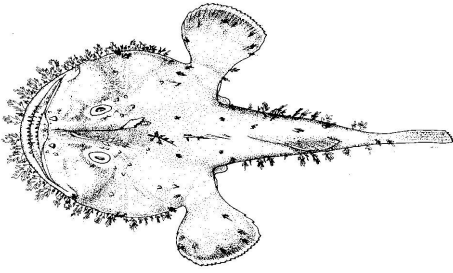
The spawning biomass of hake was estimated at about 1 million tonnes. Small fish of less than 36 cm in length made up 53% of this total biomass estimate, although there was a slight increase in larger fish (from 50 cm onwards) of both species of hake. The hake stock was

found in high abundance south of Walvis Bay to Orange River, as well as far north at the Kunene River. The 2005 biomass survey showed the total relative abundance estimate of hake at about 602 000 tonnes.

Hake resources: wet fish and freezers vessels, using the bottom trawling method, as well as the long line fleet, exploit the hake resource. The trawling fleets continue to experience high catches of small hake during the 2005-fishing season, with the mean length of catches at around 39 cm. A study into this persistent problem of small hake catches was recently concluded and the Ministry put in place management measure to protect the young fish.

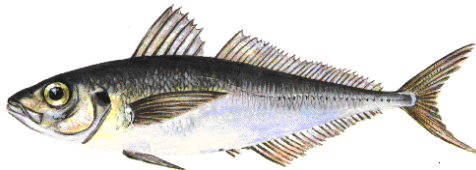
Monkfish

The monkfish stock is surveyed annually at the end of each year. The stock assessment model estimate for the fishable biomass in 2005 is at around 45000 tonnes.



Monk resources: Namibian monkfish fishery consists of two components. Firstly, monk and sole right holders targeting monkfish and secondly, monkfish caught as by-catch by the hake bottom trawlers. The hake fishery lands around 30% of the total monkfish catches annually. During 2005/06 fishing season the quota has dropped to 11 500 tonnes.

Horse mackerel

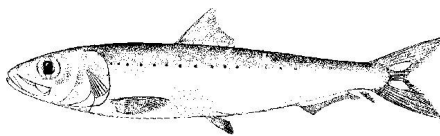


The horse mackerel stock showed improvements in regards to abundance in 2005. The stock was estimated at 1.6 m tonnes by the annual acoustic survey. This is an increase of 12.5 % as compared to the 2004 biomass estimate. The juvenile component of the stock has also shown some significant increase since last year. The high abundance of juvenile fish is expected to recruit into the adult population and boost the abundance of adult fish in the system in the next two years if growth and environmental conditions remain favorable. Maturity length has been affected by the decreasing size and as a result, 50% of the population has been found to mature at a total length of 20 cm.

Horse mackerel resources: The horse mackerel is the largest fishery in terms of volume of which the horse mackerel right holders are allocated about 86% of the TAC. In total about 313,000 tonnes of horse mackerel was landed in 2005.

3.3.4 Pilchard

The average of the two surveys in 2005 was approximately 116 000 tonnes. This was obtained from April 2005 estimate survey, which was 182 600 tonnes and from October 2005 estimate, which was about 48 800 tonnes. The estimate of 395 000 tonnes was from the October 2004 survey and when it is compared to the estimate in October 2005 there is a huge difference.

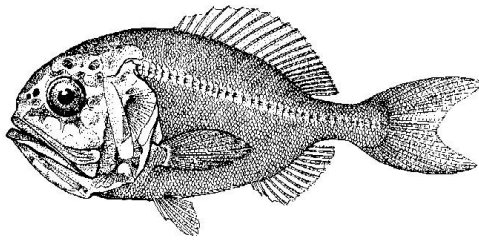


Generally, the spatial distribution of pilchard extends into southern Angola. However, in 2005 pilchard was only confined to Namibian waters in inconsistent aggregations. The absence in Angola is either due to unfavorable environmental conditions or the reduction in stock abundance.

Pilchard resources: A total of 25 121.28 tonnes (modal length at 22 cm) were landed during the 2005 fishing season against a TAC of 25 000 tonnes. Of the landings about 1 060 tonnes (modal length at 17.5 cm) were caught as by-catch of the horse mackerel directed purse seine fishery.

Orange roughy

During 2005 survey, the total biomass was estimated to be similar to last year's (2004) estimate. The swept area estimate for Johnnies was lower than in 2004 (lowest estimate since 1997) with 2 132 tonnes. The biomass on Frankies was on the other hand almost double than last year's estimate with 5 600 tonnes. Although the survey was conducted during the same period as last year spawning activity was less compared to 2004. The relative low number of spawning fish may explain why few schooling aggregations were found.



Orange roughy resources: For the 2005/2006 fishing season only two vessels were fishing on the orange roughy grounds, therefore keeping the effort and disturbance on the grounds very low. However, the industry was still unable to catch even a fraction of their TAC, indicating the

dispersal of fish on the grounds. During 2005 the CPUE was at the lowest ever for Johnnies and Frankies.

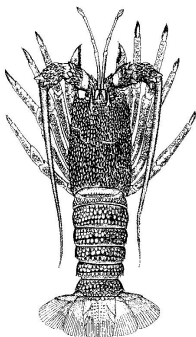
Deep sea red-crab

The biomass estimated for 2005 (using commercial data only) remains similar to that of 2004, with levels fluctuating around a stable average since 1990. Length frequency data collected by observers show that females contribute less than 15% to commercial catches and male frequencies peak at 95-105 mm Carapace Width.



Assessment of the Namibian deep-sea red crab stock for 2005 was based mainly on data from 2004, since data from the 2005 season (January to December) are still being analysed during 2006. **Deep red-crab:** Data received for 2005 (still outstanding) indicate that quotas were also filled by September, where after one of the vessels moved outside the EEZ to continue fishing for crab.

Rock lobster



The estimated fishable biomass (*De Lury model*) increased from 1400 to about 1700 tonnes in 2005. Commercial length frequency data show most of the male lobsters to occur at 60-64 mm Carapace Length (thus just below the legal minimum size limit of 65 mm Carapace Length), and females at 56-60 mm Carapace Length. Recruitment data indicate the presence of two strong cohorts and one weaker cohort (pre-recruits to the fishery) below the legal minimum size limit.

Catch rates north of Luderitz remained low (possibly due to an influx of low bottom dissolved oxygen waters during February 2005), but was higher than normal for grounds south of Luderitz. By the end of the season most of the catches came from the southern grounds (and southern quotas were exceeded), whilst quotas for both the central and northern grounds were under-caught. High surface swell conditions did not occur as frequent as during previous seasons, although long periods of low bottom

dissolved oxygen were present over the fishing grounds during February (both factors that reduce lobster catchability).

Lobster *puerulus* (final larval phase) at the Luderitz oyster farm indicates variable recruitment, with settlement in 2003 lower than that in 2004, while sampling in 2005 was too irregular to be conclusive.

Cape fur seals



The 2005 pup cohort indicated a recovery of 44% in pup numbers at Atlas/Wolf Bay compared to the 1993 level, whereas the Cape Cross 2005 pup cohort surpassed the 1993 level by 22%. The pooled pup number of the 2005 cohort for harvested colonies indicated a 73% overall recovery of the 1993 levels. The overall pooled trend for the islands seems to have stabilized and can be explained by the limited space available on islands for breeding/pupping. The pup count of Cape Frio in 1993 showed 477 individuals, which dramatically increased (within 12 years) to 20 070 individuals in 2005, thus a 42-fold increase. This increase is due to migration of probably young females from further south following the reduction in food availability of the mid 1990s

A total of 59 205 pups and 4963 bulls were harvested for the period of 2005. During the 2005 harvesting season the seal industry managed to fill 91.1% of the allocated 65 000 pup and 5 000 bull Total Allowable Catch, respectively.

Large Pelagics

The three most important tuna and tuna-like species harvested in Namibian waters are albacore, big-eye tuna and swordfish. Since the right to harvest tuna and tuna-like species was changed to a large pelagic right that includes the targeting of large pelagic sharks, the long line sector has increasingly targeted short-fin mako and blue sharks. The other sector in this industry, pole-and-line does not catch sharks.

Not all data for 2005 has been received yet from all companies but preliminary estimates up to September 2005 show that 2344 tons of albacore were landed, 271 tons of big-eye tuna,

and 729 tons of swordfish. Swordfish catches were good in 2005 with close to the same amount caught as in 2001.

The Resources: In 2005, 6615 tons of blue shark was caught compared to 751 tons in 2001. For short-fin mako shark 1415 tons were landed in 2005 (preliminary) compared to only 179 tons in 2001. Even though the 2005 data is preliminary it is clear that catches of blue shark has increased by 44% and that of short-fin mako by 91%.

The landings of tunas are monitored at Walvis Bay and Lüderitz. Observers from the FOA and research technical staff of Resource Management collect length frequencies. A large pelagic shark-tagging program was initiated through BENEFIT funding in 2004 and is now an ongoing research project.

3 MONITORING, CONTROL AND SURVEILLANCE

4.1 SEA SURVEILLANCE

Namibia deployed two Patrol vessels during the year to enforce sea surveillance functions. The table below indicates days at sea; distance covered, and number inspections by the Patrol vessels during 2005.

Table 4 Deployment of patrol vessels in 2005

Patrol vessel	Days- at sea	Distance	No of inspections
Nathanael Maxuilli	157 days	23564 nm	155
Anna Kakurukaze Mungunda	139 days	20064 nm	151
Total	296 days	43628 nm	306

Source: MFMR, 2005

The table below indicates output of Sea surveillance activities.

Table 5 Output of sea surveillance

No. Mission	Of	S u m m o n s issued	Amount Paid	Outstanding cases	Cases Withdrawn	Warnings Issued
	28	48	N\$12 900.00	0	0	7

Source: MFMR, 2005

The PV “Nathaniel Maxuilili” undertook 14 trips during the reporting year. One of the voyage was a trilateral mission with Namibian, South African and Angolan inspectors onboard conducting inspections inside the Namibian and Angolan national waters. Several inspections with minimal infringements were completed. This mission was part of the EU/ SADC fisheries MCS training program.



Figure 5PV “Nathanael Maxuilili” leaving for a Trilateral mission in waters of SADC Member States

The PV “Anna Kakurukaze Mungunda” undertook 14 trips during the reporting year. One of the missions was a trilateral mission with Namibian, South African and Angolan inspectors onboard conducting inspections inside the Namibian and South African national waters. Several inspections with minimal infringements were completed. This mission was part of the EU/ SADC MCS training program.

4.2 AIR SURVEILLANCE

The fisheries patrol fixed wing plane “Sea Eagle” undertook 86 patrol and training missions totaling 415.9 flying hours. This includes 1238 vessels observations flights. In all, the fixed wing patrol aircraft covered 69635 nautical miles. The Table below indicates the air surveillance missions during 2005.

Table 6 Deployment of patrol aircraft

Fix-wing Plane	Missions	Hours	Fuel consumption	Observations
Sea Eagle	86	415.9	120 801 liters	1 238

Source: MFMR, 2005

4.3 ONSHORE MONITORING AND CONTROL

The Walvis Bay Inspectorate undertook 1350 missions covering a distance of about 359 366 km. A total of 9 roadblocks were jointly attended with the Namibian Police, Immigration Officers and Traffic Officers during the year. A total of 1201 summons were issued. About N\$185 120.00 was paid on 741 summonses.

A total of 5 case dockets were opened at Henties Bay and Walvis Bay police stations. Four of these case dockets were provisionally withdrawn because of some technicalities. The table below indicates action taken during coastal patrol and inland missions.

Table 7 Erongo Region-Output on coastal patrol and inland missions

No. of Missions	Summon Issued	Amount Paid	Outstanding cases	Cases Withdrawn	Warning issued	Warrant of arrest Issued
1 350	1 201	185 120.00	18	55	0	184

Source: MFMR, 2005

The table below depicts the nature of offences committed and fines issued during 2005 period in Walvis Bay. There has been a slight decrease in the nature of offences compare to previous year. Ten fines were issued at Walvis Bay and an amount of N\$2 700 was paid, compared to 18 fines last year.

Table 8 Factories offences and fines issues at Walvis Bay

Operational Section	Nature of offence	Total fines issued	Total Amount (N\$)
Harbour & Midwater (section)	Fail to give notice before offloading	2	600
	Provide false information	1	300
	Offload fish without presence of inspectors	4	900
	Obstruct inspector in performance of his work	1	300
Whitefish & Pelagic (section)	Provide false information	1	300
	Fail to give notice before offloading	1	300
TOTAL		10	2 700

Source: MFMR, 2005

Lüderitz Inspectorate undertook a total of 296 coastal patrol missions, with a distance of 10 714 km. A total of 12 roadblocks were jointly attended with the Namibian Police, Immigration Officers and Traffic Officers during the Easter and Christmas seasons. The production section has cleared 76 vessels in Luderitz and two in Cape Town. A total of 192 fines were issued at Lüderitz based fishing companies in the amount of N\$57 300. Whilst, last year a total of 287 offences were committed. The table below depicts the nature of offences and fines issued at Lüderitz.

Table 9 Factory offences and fines issued at Lüderitz

Operational Section	Nature of offence	Fines Issued	Amount (N\$)

Coastal Patrol & Roadblocks (section)	Insulting a Fisheries Inspector	1	300.00
	Harvest Marine Resource without fishing permit	11	3 300.00
	Retain under size and Rock lobster in berry	25	7 500.00
	Transporting of Marine Resources without a fishing permit	3	900.00
	Harvesting more than 7 Rock-Lobster per day	8	2 400.00
	Harvesting marine Resources in restricted area	1	Case docket
	Harvesting for Rock-Lobster after Sunset	4	1 200.00
Factory Inspection (section)	Retain undersize and Rock-Lobster in berry	102	30 600.00
	Determine the mass of fish without the presence of a fisheries Inspector	2	600.00
Observers reports	Threatening of Fisheries Observers	5	1 500.00
	Illegal transshipment of marine resources at sea	5	1 500.00
	Failing to complete logbooks	7	2 100.00
	Not carrying official documents onboard	5	1 500.00
	Discarding of Marine Resources	3	900.00
	Fail to submit their log sheets to the office	4	1 200.00
	Leaving without a Fisheries Observer onboard	6	1 800.00
TOTAL		192	57 300.00

Source: MFMR, 2005

During the period under review the surveillance unit opened six case dockets. One case was successfully prosecuted. One case was withdrawn and four cases are still pending due to the unavailability of magistrates in Luderitz.

4.4 MANNING OF PATROL VESSELS

The year 2005 witnessed the phasing out of Scandinavian officers onboard the Namibian patrol vessels. Namibian marine officers attained the basic knowledge and skills at both the deck and engine departments. Consequently, qualified Namibian marine officers took over all positions onboard the patrol vessels that were previously held by their Scandinavian counterparts.

4.5 DECOMMISSIONING OF PV “*TOBIAS HAINYEKO*”

PV “*Tobias Hainyeko*” one of the pioneers in the Namibian sea surveillance bid farewell to the service. The vessel kept fish pirates out of Namibian waters for more than 13 years. Old age and harsh sea conditions gradually rendered “*Tobias Hainyeko*” unfit for surveillance in the rough Namibian sea. As a result, Cabinet recommended for the relief of PV “*Tobias Hainyeko*” from sea surveillance.



Figure 6 PV “*Tobias Hainyeko*” berthing along side MFMR’s jetties in Walvis Bay, waiting for further national assignments after she bid farewell to sea surveillance in April 2005

4 THE MARINE RESOURCES SECTOR

The Marine Fisheries Sector continued to be one of the important contributors to the Namibian economy during 2005, second to the mining sector in terms of export value.

5.1 NUMBER AND DURATION OF FISHING RIGHTS

The total number of existing rights in 2005 was 158. Table 10 shows the number and duration of existing harvesting rights for each species. So far no person has been granted a 20-year right of harvesting, as none of the applicants meet the criteria.

Table 10 Number and duration of existing harvesting rights as at December 2005

FISHERY	DURATION OF RIGHTS				
	Seven-Year	Ten-Year	Fifteen-Year	Twenty-Year	TOTAL
Hake	10	6	22	0	38
Monk	2	2	5	0	9
Horse Mackerel	0	11	1	0	12
Large Pelagic	1	6	12	0	19
Red Crab	1	2	0	0	3
Rock Lobster	0	1	20	0	21
Line Fish	1	2	8	0	11
Orange Roughy	0	5	0	0	5
Pilchard	7	5	10	0	22
Mulletts	0	0	13	0	13
Seals	2	1	1	0	4
Guano	1	0	0	0	1
Total	25	41	92	0	158

Source: MFMR, 2005

During 2005 evaluation of all seven and ten year rights that are due to expire in 2007 and early 2008 was carried out.

2 VESSEL LICENCES

The number of licensed vessels operating in Namibian waters from 2001 to 2005 is indicated in Table 11 below. A total of 308 vessels were licensed for commercial fishing in 2005.

Table 11 Number of licensed vessels by fishery, 2001 - 2005

FISHERY	2001	2002	2003	2004	2005
Small pelagic	26	25	20	16	17
Demersal Trawlers	128	114	100	125	121
Longliners	38	10	8	17	28
Midwater	24	20	26	24	15
Deepwater	3	6	5	5	4
Large pelagic	68	71	49	73	52
Linefish	22	26	19	16	16
Crab	2	2	3	2	2
Rock lobster	29	38	42	34	28

Monk		23	21	22	25
Total	340	335	293	334	308

3 TOTAL ALLOWABLE CATCHES AND LANDINGS

The setting of Total Allowable Catches (TAC) is one of the main management measures to prevent overexploitation of Namibian marine resources (fish stocks). TACs are set for most commercial species in Namibia. Table 12 shows the TAC's set by fishery during 2001 - 2005.

Table 12 Total Allowable Catches, 2001-2005 in tonnes.

Year	Pilchard	Hake	Horse Mackerel		Red Crab	R o c k Lobster	O r a n g e Roughy	Monk
			Mid water	Pelagic				
2001	10 000	200 000	410 000	(50 000)	2 100	400	1 875	13 000
2002	0	195 000	350 000	(40 000)	2 200	400	2 400	12 000
2003	20 000	180 000	350 000	(40 000)	2 000	400	2 650	12 500
2004	25 000	195 000	350 000	(40 000)	2 200	420	2 600	12 000
2005	25 000	180 000	350 000	(45 000)	2 300	420	2 050	11 500

Figures in brackets indicate the portion of the TAC of industrial fish caught for fishmeal, MFMR. 2005

Table 13 Harvest of the main commercial species, 2001- 2005

SPECIES	2001	2002	2003	2004	2005
Pilchard	10 763	4 160	22 255	28 605	25 128
Hake	173 277	154 588	189 305	173 902	158 060
Horse mackerel	315 245	359 183	360 447	310 405	327 700
Monk	12 390	15 174	13 135	8 961	10 466
Kingklip	6 607	7 210	6 603	7 067	5 567
Tuna	3 198	2 837	3 371	3 581	3 654
Crab	2 343	2 471	2 092	2 400	2 480
Rock lobster	365	361	269	214	248
Other fish species	30 810	77 407	33 644	31 997	18 934
Total fish harvest	54 998	623 391	631 119	567 133	552 164
Seals	44 223	40 000	34 000	31 971	64 167
Seaweed (Gracilaria collection)	800	500	288	N/a	

Source, MFMR, 2005

Table 13 gives the total volume of marine fish production during the 2001 – 2005. The total volume of marine resources production for 2005 amounts to about 552,164 tonnes. This yield level compares with 567,133 tonnes landed during the previous year, reflecting a decline of 2.6%.

The observed lower landings for 2005 are mainly due to among others especially juvenile catch in the hake stock. The hake fishery usually accounts for over a quarter of annual production and about 70% of the total landed value. Reduction in the production level in the hake fishery has significant effects on overall annual yield level. Furthermore, annual production in the pilchard-directed purse-seine fishery and deep-sea fishery has fallen due to unfavorable environmental conditions at sea. The hake sub-sector was particularly affected by unfavorable size-mix, characterized by proportionately high incidence of juvenile fish in trawl catches. As a result, Catch Per Unit Effort (CPUE) has fallen as fishers incur fishing costs in avoidance of juvenile catches and in favor of greater stock conservation.

In addition, the exchange rate volatility, mainly due to the appreciation of the Namibian Dollar against US Dollar as well as rising price of crude oil were not the most favorable to the fisheries sector during this period. As a result, less fishing effort was deployed during the year so as to mitigate the effects of increasing cost of fishing. This affected the operation of major fisheries such as those for hake, horse mackerel and tuna.

4 CATCH VALUE

The value of fish and fish products serves as an indicator of the performance of the fishing sector. Table 14 shows the three different value indicators for fish and fish products from 2001 to 2005. The first indicator is the landed value of the catch. This is the value of the fish in the form the fish is landed (i.e.) ex vessel prices). The value of fisheries production has increased substantially since 1991 mainly due to an increase in the prices obtained in the export markets as well as value addition. Landed value has increased greatly from N\$ 2,531 in 2004 to N\$ 3 130 billion in 2005.

The second indicator is the final value of the fish; this is the value of fishery products in their final form at export price. The difference between the landed value and the final value is due to value addition by onshore fish processing. Despite lower aggregate output, the price for major species and value added moderately improved during 2005. As a result, the landed value and final value of total production have shown a moderate increase relative to the previous corresponding period. This comes about as a result of better quality of Namibian fishery products.

The final indicator is the export value, which gives the Namibian dollar equivalence of foreign currency earnings brought into Namibia due to the sale of fish and fishery products. Since an estimated 90 percent of total fish production is exported, the value of exports closely follows the same trend as the final value. The export value has drastically increased from N\$ 3 350 billion in 2004 to N\$ 3 697 billion in 2005. The Marine Fisheries Sector is currently the second biggest earner of foreign exchange in Namibia after the mining sector.

Table 14 Value of Fish and Fish products - 2001-2005 (N\$ millions)

	2001	2002	2003	2004	2005
Landed Value	2.335	2.608	2.862	2.531	3.130
Final Value	2.932	3.394	3.867	3.427	3.789
Export Value	2.862	3.311	3.781	3.350	3.697
% of Total export of goods	25.8	23.8	27.6	23.5*	22.9*

Source: MFMR & NPC final figures (% of Total export of goods for 2004 & 2005 is still provisional)

5.5 CONTRIBUTION TO GROSS DOMESTIC PRODUCT (GDP)

An important economic indicator for the fishing sector is contribution to GDP. This is essentially the gross income earned, wages and salaries, gross profits, and indirect revenues from fish production. It does not, include the value of intermediary inputs and it is therefore much less than the value of production.

Table 15 indicates the contribution of the fishing industry to GDP, both for harvesting and processing. In 2005, the sector contributed 5.9% to GDP, compared to 6.5% to GDP in 2004. Contribution of the fisheries sector to GDP has shown an increase in both the fishing and processing onboard and a decrease of 31% in processing onshore due to a decrease in total landings.

Table 15 Fisheries contribution to GDP, 2001-2005, at current prices (N\$ Million)

GDP Contribution:	2001	2002	2003	2004	2005
Fishing and fish processing on board	1,445	1,608	1757	1545	1714
Processing	494	703	876	799	548
Total	1,939	2,311	2633	2344	2262
% of GDP	6.9%	7.0%	7.8%	6.5%	5.9%

Source: NPC, 2005

6 REVENUES GENERATED

Table 16 Revenue from the marine fishing industry, 2001-2005(N\$ millions)

Fee	2001	2002	2003	2004	2005
Quota fees	69 900	100 011	74 437	84 629	81 363
Marine Resources Fund levy	9 211	15 794	12 042	17 663	17 358
By-catch fees	12 800	15 788	13 561	16 294	7 699
License fees	172	286	187	110	111
Total revenue	82 083	131 879	100 227	120 292	1 06 531

Source: MFMR, 2005

The above table shows the revenue generated by the government from the fishing industry for the past five years. The table clearly indicates that there is a revenue decrease of 11.4% during 2005 as compare to 2004 increase of 20%. Right holders are accountable to pay quota fees and any other related fees as outlined in the table.

Revenue generated from recreational fees and fishing permit

Table 17 Fishing permits issued and revenue generated: 2005.

Month	Permits issued	Revenue collected (N\$)
January	4640	85 442.00
February	4271	75 964.00
March	7542	126 532.00
April	3607	59 276.00
May	3356	55 300.00
June	1963	32 256.00
July	2763	45 612.00
August	2763	54 026.00
September	2836	46 340.00
October	2485	53 410.00
November	5137	103 026.00
December	1288	223 538.00
Grand Total	54312	960 722.00

Source: MFMR, 2005

Table 18 Types of permit issued in 2005.

Period	Total number of Permits	Amount Received (N\$)
Monthly permits issued	53011	742,154.00

Year permits issued	1301	21,868.00
Total	54312	960,722.00

Source: MFMR, 2005

Table 19 Angling permits issued by nationality in 2005.

Nationality	Total Number of Permits	Amount Received (N\$)
Namibians	39244	746,690.00
Non- Namibians	15068	214,032.00
Total	54312	960,722.00

Source: MFMR, 2005

The Marine Aquarium: Visitors and Income

The number of visitors (individual and groups) that visited the Aquarium decreased to 34156 during 2005 (Table 20), compared with 35 360 during 2004. Revenues generated also decreased slightly from N\$ 316 640 during 2005 (Table 20), compared to N\$343 964 during 2004.

Table 20 Income generated from the National Marine Aquarium in 2005

2005	Number of visitors	Revenue (N\$)
Children	8373	41 865
Foreign Children	781	11 715
Pensioners	765	3 825
Foreign Pensioners	436	6 540
Adults	13278	132 780
Foreign Adults	3616	108 480
Students	514	2 570
School Groups	5775	5 775
Teachers	618	3 090
Total Income Generated	34156	316 640

Source: MFMR, 2005

5 AQUACULTURE SECTOR

Government continues to promote the role of aquaculture to enhance food security, reduce poverty, generate employment, improve rural livelihoods and increase investment. The development of this sector will require substantial capital and technical expertise and challenges the financial institutions to embark in funding aquaculture projects. During 2005, the MFMR embark upon a campaign and organized an Investment Conference for Aquaculture. Local and international investors/stakeholders attended and participated at the conference and the way forward for aquaculture development was fully deliberated on.

6.1 MARINE AQUACULTURE

During 2005 the water quality program as part of the pilot monitoring program was expanded to include sampling a new Mari culture farm at Henties Bay. The program now covers the area from Pelican Point in Walviabay to Henties Bay. All results obtained from the monitoring programme clearly show excellent water quality along the costal farms.

The period under review (2005) the production of oysters increased to six million with new entrants eager to join this lucrative sector. The expansion of the abalone farm at Lüderitz has surpassed all expectations, with the addition of new raceways to ensure an annual production of 100 tonnes. The lack of accredited laboratories that can provide the required turnover time to satisfy international market requirements is currently a major factor stalling Mari culture expansion into these markets. Ongoing efforts are being made to realize national laboratories to carry out the prescribed tests required for export to overseas markets.



Figure 7 Land based ponds of abalone farm at Luderitz

The Ministry initiatives in Mari-culture received excellent co-operation from the current license holders, the municipalities of the coastal towns as well as from Namibia Ports Authority (Namport). Good working relationships with these entities allowed for efficient and continuous growth of this industry.

2 INLAND FRESH WATER AQUACULTURE

At Hardap Freshwater Fish Institute in Hardap Region and Onavivi Inland Aquaculture Centre in Omusati Region fingerlings are being produced at a large scale to meet the demands of ever increasing small scale fish farmers. Fingerling have been distributed by Onavivi centre close to 200 small scale fish farmers in the four north western regions. The Institute has been supplying fingerlings to marginalized communities in the Omaheke, Karas and Hardap Regions. The distribution of fingerlings is currently being extended to include communities living in the Khomas, Erongo and Otjizondjupa Regions. Site visits to all thirteen Regions to determine their suitability for aquaculture is envisaged.



Figure 8 **Harvesting of Hardap Dam (December 2005)**

Onavivi Inland Aquaculture Centre, Omusati

During 2005, close to 300 000 fingerlings (tilapia and catfish) were distributed to a total of 191 small scale fish farmers. This number, compared to the previous year, where only 90 000 fingerlings were distributed, proves that a demand of fresh water fish species is on the increase. At the same time aquaculture development in the four regions (Omusati, Oshana, Ohangwena and Oshikoto) remains a priority.

Table 21 Production season for small scale fish farmers

Production season	Number of fish farmers	Fingerlings produced
2003/04	69	90 000
2004/05	191	300 000

Those that have received fingerlings during the reporting year were assisted by MFMR team with harvesting of their production, with a few of them making it through to the market places to promote and sell their product.



Figure 9 Breeding and grow-out production ponds at Inland Aquaculture Centre in the Omusati region



Figure 10 The Hatchery, showing the buckets where the fries are reared in the second stage of fingerling production at Inland, Aquaculture Centre

6.2.2 Co-operative Fish Farms in the Kavango and Caprivi Regions

The six community-based fish farms established in these two regions continued to progress during the period under reporting. The main highlights during this period was the harvesting and the sale of fish at the three fish farms in the Kavango Region. In addition, these fish farms were able to sell vegetables and fruits as part of integrated aquaculture that the Ministry is promoting at these two Regions.

Due to flooding experienced during the 2005 season in the Caprivi Region, harvesting will only take place during 2006.



Figure 11 Harvesting fish at Karovo fish farm in the Kavango region



Figure 12 Vegetable garden at Karovo fish farm

Aquaculture initiatives in other Regions as indicated below

In the Omusati and Kavango Regions, Government is in the process of establishing the Epalela Fish Farm and Kamutjonga Research and Training Centre respectively. The Centre will be involved in research, training, fingerlings production and act as an information centre for both inland and aquaculture. The Epalela Fish Farm will mainly focus on fingerling production in the Oshikoto, Omusati, Ohangwena and Oshana.



Figure 13 Part of the Administration building of the Kamutjonga Research and Training Center, next to the Kavango River, Kavango Region

In the Karas and Hardap Regions, several sites with aquaculture potential have been identified with the aim of enhancing food security. Furthermore, the Ministry has assisted communities in the harvesting of fish from dams in their regions. In order to provide advice to small-scale fish on various aspects of fish farming, the in service training of extension officers in the Ministry is an ongoing activity.



aquaculture site at Gainachas, Karas Region

**Figure 14
Potential**



Figure 15 Naute Dam, in the Karas Region & Voigtsgrund, Hardap Region

Hardap Dam was harvested and the fish sold in Mariental. This was to promote fresh water fish in the area. Approximately 7 tonnes were harvested from Hardap Dam and the species consisted of Mudfish, Moggel, Yellowfish, Carp, Catfish and Tilapia. The catches were dominated by Mudfish in number as well as in weight. The preferred species during the sale were the Tilapia, Catfish and Carp.

Monitoring programs

The annual monitoring surveys were conducted in the Lower Orange, Zambezi, Chobe, Kwando, Okavango and Kunene Rivers. Biological data were recorded that form part of a program to generate a database for these rivers that will be used for future comparisons and to identify trends in the fish population structures. A total of more than 250 000 fish species are already on databases that were sampled over the years. On table 22 to 25 are the ten most important species listed in the different river systems. The importance is expressed as the Index of Relative Importance (IRI) and is calculated taking into account the number of fish sampled per species, the total weight of each species sampled and the frequency sampled (how often a species is being sampled). A total of 25 species was collected from the Lower Orange River (including marine species that are entering the river mouth), 54 from the Kunene River (including marine species also entering the river mouth), 73 species from the Okavango River and 74 species from the Caprivi System.



Figure 16 **Kavango River**

The subsistence fishery in the Caprivi, Kavango, Oshana, Ohangwena, Oshikoto and Omusati Regions play an important role in the daily lives of the rural communities. It is estimated that approximately 2800 tonnes are harvested from these regions worth nearly N\$ 22 million at an average value of N\$ 8.00/kg for the fish sampled (according to surveys done by the University of Namibia). The fishing season in the Omusati, Ohangwena, Oshikoto and Oshana regions are only seasonal when the oshanas are flooded during the rainy season whereas the fishery in the Caprivi and Kavango Regions are done throughout the year. The fishing do intensify during the low water periods in these regions when fish are concentrated and catches may be higher than during the flooding season.

Table 22 The ten most important species sampled in the Lower Orange River since 1995.

Species	% Number	% Weight	% Frequency	% Index of Relative Importance
<i>Labeobarbus aeneus</i> Smallmouth Yellowfish	13.6	38.2	37.3	49.2
<i>Labeo capensis</i> Orange River Mudfish	19.5	21	30.3	31.3
<i>Liza richardsoni</i> Southern Mullet	27	10.7	8.1	7.8
<i>Clarias gariepinus</i> Sharptooth Catfish	1.2	13.6	7.8	3
<i>Oreochromis mossambicus</i> Mozambique Tilapia	7.2	3	10.9	2.8
<i>Barbus trimaculatus</i> Threespot Barb	5.8	0.5	12.4	2
<i>Labeobarbus kimberleyensis</i> Largemouth Yellowfish	1	4.3	10.2	1.4
<i>Mesobola brevianalis</i> River Sardine	9.4	0.1	4.5	1.1
<i>Pseudocrenilabrus philander</i> Southern Mouthbrooder	3.7	0.1	4.4	0.4
<i>Barbus hospes</i> Namaqua Barb	3.9	0.1	3.7	0.4

Table 23 The ten most important species sampled in the Kunene River since 1990.

Species	% Number	% Weight	% Frequency	% Index of Relative Importance
<i>Schilbe intermedius</i> Silver Catfish	4.7	13.4	19.1	22
<i>Brycinus lateralis</i> Striped Robber	16.8	2.6	13.5	16.6
<i>Labeo ansorgii</i> Kunene Labeo	3.2	11.1	11.2	10.2
<i>Barbus mattozi</i> Papermouth	2.6	7	14.7	9
<i>Synodontis</i> spp. Squeaker	6.4	3.7	11.5	7.4
<i>Thoracochromis buysi</i> Namib Happy	8.8	0.7	9.3	5.6
<i>Micralestes acutidens</i> Silver Robber	7.6	0.4	8.4	4.3
<i>Hepsetus odoe</i> African Pike	0.9	7.9	7.4	4.2
<i>Marcusenius macrolepidotus</i> Bulldog	3	2.5	10.4	3.6
<i>Clarias gariepinus</i> Sharptooth Catfish	0.4	13.9	3.4	3.1

Table 24 The ten most important species sampled in the Zambezi, Chobe and Kwando Rivers since 1997.

Species	% Number	% Weight	% Frequency	% Index of Relative Importance
<i>Brycinus lateralis</i> Striped Robber	30.3	9.9	18.8	36
<i>Schilbe intermedius</i> Silver Catfish	7.5	9.6	25.2	20.6
<i>Hydrocynus vittatus</i> Tigerfish	2	14	13.4	10.2
<i>Synodontis</i> spp. Squeaker	5.6	3.6	14.1	6.2
<i>Clarias gariepinus</i> Sharptooth Catfish	0.4	25.2	3.9	4.8
<i>Marcusenius macrolepidotus</i> Bulldog	4.6	3.1	11.5	4.2
<i>Petrocephalus catostoma</i> Churchill	7.3	1.9	8.1	3.5
<i>Barbus poechnii</i> Dashtail Barb	3.7	0.9	10.3	2.3
<i>Hepsetus odoe</i> African Pike	0.8	4	7.9	1.8
<i>Micralestes acutidens</i> Silver Robber	6.3	0.3	5.7	1.8

Table 25 The ten most important species sampled in the Okavango River since 1992.

Species	% Number	% Weight	% Frequency	% Index of Relative Importance
<i>Schilbe intermedius</i> Silver Catfish	11.8	20.2	29.8	33.9
<i>Synodontis</i> spp. Squeaker	13.1	9.7	24.9	20.2
<i>Marcusenius macrolepidotus</i> Bulldog	6.7	7.4	20.7	10.3
<i>Brycinus lateralis</i> Striped Robber	8.5	3.2	18.3	7.7
<i>Hydrocynus vittatus</i> Tigerfish	1.5	7	12.7	3.8
<i>Tilapia sparrmanii</i> Banded Tilapia	5	1.4	16.2	3.7
<i>Barbus poechnii</i> Dashtail Barb	5.1	0.9	13.6	2.9
<i>Synodontis nigromaculatus</i> Spotted Squeaker	2.5	4.8	8.4	2.2
<i>Clarias gariepinus</i> Sharptooth Catfish	0.4	12.3	4.7	2.1
<i>Pseudocrenilabrus philander</i> Southern Mouthbrooder	5.3	0.3	8.9	1.8

Lake Liambezi was also monitored during the period 2004 to 2005 when the waterlevel declined. The objective was to establish the fish population dynamics of a lake which is flooded only periodically. This will give some insight into the establishment of pioneer fish species and those that are able to endure extreme conditions.

7 HUMAN RESOURCE DEVELOPMENT

The Ministry continued to train its staff members at all levels and in various fields. During the year under review, about a hundred (100) staff members benefited from numerous skills and qualify for training.

a) Training per Directorate

The Ministry has managed to train an average record of nineteen (19) staff members per directorate in 2005. The Ministry has trained a maximum number of 25 staff members (of which fifteen were qualifying training) and mostly from the engine and deck section of the patrol vessels as well as from the division inspectorate.

A particular emphasis was put on the directorate of Aquaculture, where staff members underwent courses covering quality control and monitoring of aquaculture farming management. Aquaculture staff members also undertook theoretical and practical studies and laboratory analysis of biological samples while others attended training in different environment impact assessment.

The Ministry has trained the sea going personnel on mandatory courses such as Basic Safety and Survival at Sea at Namibian Maritime and Fisheries Institute (NAMFI). Further courses in statistics and fisheries management were also undertaken.

The Ministry has trained very few staff members during the year. The staff members from the general services Division undertook courses in finance, personnel administration, general administration, internal auditing and stocktaking.

7.1 BURSARIES

The Ministry provides a bursary scheme for staff members. Bursaries are awarded on an annual basis for staff members to further their studies in fields relevant to their daily duties. Funding is provided from the Marine Resources Fund. In 2005, fourteen (14) staff members were awarded bursaries and thirty three (33) were awarded from the previous years which give a total of 47 staff members benefited from the bursary scheme, pursuing various degrees, diplomas and certificates in Science, Fisheries and Management Science, Aquaculture Management and Administration, locally and abroad on part-time or full-time basis.

7.2 DECK OFFICER TRAINING

The Ministry continued with the training and upgrading of Deck Officers to Class II Certificate level as required by Standard of Training and Certification Watch-keeping 1995 SWTC 95 Convention. Six staff members were registered with NAMFI and successfully completed the training. This training is essential and allows these officers to take over officer positions occupied by expatriates on patrol vessels.

7.3 MARINE ENGINEER OFFICER TRAINING

As Class II is not offered by NAMFI the Ministry sent four Engineer Officers to Northlink College in Cape Town, South Africa, with financial assistance from EU-MCS Project to upgrade skills to Class II Certificate level as required by Standard of Training and Certification Watch-keeping (S.T.C.W.'95) Convention. They have successfully completed the theory and would be attached to the ministry to complete the required sea time.

7.4 TRAINING AT NAMIBIAN MARITIME AND FISHERIES TRAINING

INSTITUTE (NAMFI)

NAMFI continues to play an important role in the training of Namibians for the fishing industry. By 2005 NAMFI trained an average of 500 students in navigation, engineering, safety at sea and Monitoring, Control and Surveillance.

The structure of the Institute was re-organised by the Board following the completion of a study that examined the requirements of the International Convention on Standards of Training, Certification and Watch-keeping for Seafarers. This Convention has compelled NAMFI to re-orient its educational strategies and methods and to carry them out in accordance with the required international standards.

7.5 DONOR ASSISTED TRAINING

The Ministry receives support for capacity building through training of technical and professional staff. Donor agencies that continued to provide support for capacity building during the year were BENEFIT, BCLME, NORAD, ICEIDA, and SADC Regional Fisheries MCS Programme. A total of 9 staff members benefited.

8 REGIONAL FISHERIES RELATIONS

8.1 SADC REGIONAL FISHERIES MCS PROGRAMME (SADC/MCS)

The financing Agreement on the SADC Regional Monitoring, Control and Surveillance of fishing activities was signed between EU and five SADC coastal states namely: Namibia, Angola South Africa, Mozambique and Tanzania in 2000, but only come into effect in March 2002.

The overall objective of the programme is to improve management of marine fisheries resources of the SADC coastal member states. The main purposes of the programme are:
Basic national Institutional capacity for efficient, cost effective and establishment of a sustainable MCS.

Establishment of mechanisms for effective regional cooperation on MCS.

The main activity during 2005 was to finalize regional and national activities workshop for work plan no.7 (seven) of which the following were accomplished:

- Regional Economics workshop and the regional legal workshop were held in South Africa, Johannesburg
- Regional MCS course attend by 2 Fisheries Inspectors and 2 representatives from the Fisheries Observer Agency (FOA) in Bagamoyo, Tanzania.

- A final report on the review of Fisheries Legislation was completed by the local and International consultants and submitted to the MFMR.
- A steering Committee Meeting was held in Durban, South Africa.

During the period under review the final national project evaluation was completed. The project will be finalized by the end of March 2006. However, the final wind-up of the regional project will be finalized in July 2006. Some activities could not be finalized due to late approval of the funds from EU delegation in Brussels.

8.2 BENGUELA LARGE MARINE ECOSYSTEM PROGRAMME (BCLME)

During 2005, major BCLME Programme activities in which Namibia participated were as follows:

- a) A workshop on the establishment of a regional fish ageing centre was held in Swakopmund.
- b) The Angola-Benguela front workshop held in Swakopmund was attracted regional and international scientists.
- c) The National Task Group workshop organized by Ecosystem Approach to Fisheries.
- d) A training workshop on determination of optimal harvesting strategies for the hake trawling and long-lining fisheries in Namibia and South Africa was held in Windhoek.
- e) The state of environment information system meeting was held in Cape Town.

8.3 BENGUELA ENVIRONMENT FISHERIES INTERACTION AND TRAINING PROGRAMME

During 2006, some significant developments and events occurred through BENEFIT programme. Staff members through BENEFIT participated at the Southern African Marine Science Symposium (SAMSS) 2005 held in Durban 2005. The Nansen programme, came to an end in December 2005. However, a further three years of funding (2005-2007) was secured with the GTZ, while two years is possible to be funded by Norway. A new proposal concerning Nansen programme was developed and submitted to the Norwegian Embassy in Pretoria in July 2005

9 INTERNATIONAL FISHERIES RELATIONS

9.1 SOUTH EAST ATLANTIC FISHERIES ORGANISATION (SEAFO)

The 2nd annual meeting of SEAFO was held on 3rd to 6th October 2005, Windhoek, Namibia. The meeting witnessed the inauguration of the Scientific Committee of SEAFO. The following Conservation Measures were adopted.

- (a) Conservation Measure 01/05 relates to the monitoring of fisheries in SEAFO Convention area.
- (b) Conservation Measure 02/05 dealing with interim Port State measures.

2 INTERNATIONAL COMMISSION FOR THE CONSERVATION OF ATLANTIC TUNAS (ICCAT)

ICCAT is responsible for the conservation and management of tunas and tuna-like species in the Atlantic Ocean and adjacent seas. Namibia became a member of ICCAT in 1999 due to the fishing interests for albacore tuna, swordfish and sharks. The lucrative Namibian fisheries for large-pelagic species consist of 19 right holding companies. The United States of America, European Union and Japan are the most important markets for Namibia's swordfish, tuna and shark products.

In November 2005, Namibia attended the 19th regular meeting of ICCAT held at Sevilla, Spain. The outcome of this meeting maintained the favorable fishing possibilities for Namibia in the ICCAT Convection area. This is in regard to the four-year swordfish country quota allocated in 2002 which assigned Namibia a total of 1,070 tonnes of Swordfish in 2005, a three-year catch sharing arrangement for albacore tuna and a 2,100-tonne catch limit for big-eye tuna. An important decision taken at this meeting regards measures for controlling transshipment of catches of tuna and tuna-like species on the high-seas, envisaging the establishment of an ICCAT Observer Program in 2007. Namibian national laws do not allow transshipment of catches made under a Namibian fishing licence on the high-seas, corresponding to our national abhorrence for Illegal, Unreported and Unregulated (IUU) fishing, most prevalent in the transshipment activities at sea.

Another important development for Namibia and other developing member states of ICCAT was the coming into force of the Madrid Protocol of 1992 in March 2005. The Madrid Protocol provides for preferential treatment of developing states' financial contribution to ICCAT.

9.3 INTERGOVERNMENTAL ORGANISATION FOR FISHERY INFORMATION AND CO-OPERATION SERVICES FOR FISHERY PRODUCTS IN AFRICA (INFOPECHE)

INFOSA continue to serve the industry as well as authorities in the region with marketing and technical information, and during the 2005 – 2006, INFOSA organized a workshop on WTO and fisheries, held in Windhoek in April 2005. INFOSA also organized a workshop on “International Trade and Marketing Requirements” held in Beira, Mozambique in November 2005. The Unit also participated in the “Fish Africa” exhibition in Cape Town, South Africa, in November 2005.

INFOSA has undertaken and published market studies on “Possibilities for value addition for Namibian pelagics”, “Nile perch – market potential in southern Africa”, and “The market for freshwater small pelagics in southern Africa”. The unit also publishes approx. 60 short market updates on various fisheries products each year, and publishes the newsletter “INFOSA Trade News” twice every month.

9.4 COMMISSION FOR THE CONSERVATION OF ANTARCTIC MARINE LIVING RESOURCES (CCAMLR)

Namibia participated at the 24th Annual Meeting of the Commission in Tasmania, Australia (24 October – 4 November 2005). The meeting endorsed that Namibia host CCAMLR Working Group meetings in 2006.

Annex 1: Useful contacts

Institution and contact details	
Ministry of Fisheries and Marine Resources (MFMR)	
Head Office, Private Bag 13355, Brendan Simbwaye Square, Block C,	Office of the Minister, sectoral policy, planning and economics, fisheries

Corner of Uhland & Goethe Streets, Windhoek, Namibia. Tel: +264 61 2053 911 Fax: +264 61 233 286 www.mfmr.gov.na	administration, legislative controls, data collection and analysis.
National Marine Information and Research Centre, (NatMIRC), Strand Street, Box 912, Swakopmund. Tel: +264 64 410 1000 Fax: +264 64 404 385	Applied fisheries and environmental research, physical, biological and chemical oceanography, stock surveys and stock assessment, advice to MFMR on TACs for commercial stocks and other management measures, regional programmes and research collaboration, aquaculture and inland fisheries research and development.
NatMIRC Research Centre, Luderitz. Tel: +264 63 202 415 Fax: +264 63 202 495	Branch of the Swakopmund regional office. Main research activities include seals, seaweed, rock lobster as well as regular commercial fish stock surveys and assessment work.
Hardap Freshwater Research Institute, Private Bag 2116, Mariental. Tel: +264 63 240 361 Fax: +264 63 242 643 Inland Fisheries - Rundu Office Private Bag 2084, Rundu. Tel: +264 66 256 853. Fax: +264 256 867 Inland Fisheries – Katima Mulilo Office Private Bag 1004, Ngweze. Tel: +264 66 253 224. Fax: +264 66 253 226	Freshwater fish and invertebrate research, migrations of freshwater fishes using radio tagging, development of freshwater aquaculture techniques and assessment of candidate species.
Fisheries Inspectorate Office, Box 394, Luderitz. Tel: +264 63 202 905 Fax: +264 63 203 337	Monitoring, control and surveillance of marine commercial and recreational fisheries.
Fisheries Inspectorate Office, PO Box 1594, Walvis Bay. Tel: +264 64 201 6111 Fax: +264 64 205,008	Monitoring, control and surveillance of marine commercial and recreational fisheries.
Regional programmes	

SADC Regional Monitoring, Control and Surveillance of Fishing Activities Programme, Private Bag 13355, Windhoek Namibia. PO Box 9768, Windhoek, Namibia. Tel: +264 61 205 3016 Fax: +264 61 242 502 www.mcs-sadc.org	EU-funded regional programme to enhance capacity in regard to MCS matters.
Benguela Current Large Marine Ecosystem (BCLME) Programme, PO Box 40728 Aussenplatz Circle, Windhoek, Namibia. Tel: +264 61 246 948 Fax: +264 61 246803 E-mail: pcu@bclme.un.na www.bclme.org	Multinational cross-sectoral initiative by Angola, Namibia and South Africa to manage the living marine resources of the Benguela Current Large Marine Ecosystem in an integrated and sustainable manner and to protect the marine environment.
Benguela Environment Fisheries Interaction and Training (BENEFIT) Programme, PO Box 912, Swakopmund, Namibia. Tel: +264 64 410 1165 Fax: +264 64 405 913 www.benefit.org.na	To establish a research framework for biological and oceanographic investigation of the entire Benguela Current system. Principal focus is training in resource management research in support of the major fisheries of the three co-operating countries: Namibia, South Africa and Angola.
INFOPECHE Unit, Kenya House, 4th Floor, Robert Mugabe Avenue – Windhoek – Namibia. Tel: +264 61 205 3112/3 Fax: +264 61 205 3041 E-mail: infosadc@mweb.com.na Web page: www.globefish.org/entry_infopech.htm	Provides timely information regarding prices and trends in the marketplace and stimulates greater intra-regional and international trade in fish products.

Other institutions	
Namibian Maritime and Fisheries Institute (NAMFI), PO Box 3228, Walvis Bay. Tel: +264 64 203 114 Fax: +264 64 203 112 e-mail: chantel@namfi.net	Main institute providing education and training. Observers, patrol boat personnel and fisheries scientists.

Fisheries Observer Agency, PO Box 2903, Walvis Bay. Tel +264 64 219 500 Fax: +264 64 219 547/8 e-mail: reception@foa.com.na Website: www.foa.com.na	Management and administration of the MFMR Fisheries Observer Programme.
Fishing industry associations: Pelagic Fishing Association Hake Association Midwater Trawling Association Monk and Sole Association Tuna and Hake Longlining Association Deepwater Fishing Sector	PO Box 2513, Walvis Bay, Namibia. Phone: +264 (0)64 20 9083. Fax: +264 (0)64 20 6158. E-mail: hardrud@iafrica.com.na