REPUBLIC OF NAMIBIA

MINISTRY OF FISHERIES AND MARNE RESOURCES









Annual Report 2019/2020

Our mandate

To sustainably managed the living aquatic resources and promote the aquaculture sector

Our vision

Namibia to be a leading fishing nation with a well-developed aquaculture

Our mission

To responsibly manage living aquatic resources to continuously ensure a conducive environment for the fishing and Aquaculture sector to prosper

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The fishery in the Zambezi and Kavango regions are done throughout the year with about 33% of the communities along the Zambezi and Chobe completely dependent on fishing for their livelihood. The fishing in the Kavango and Zambezi River systems do intensify during the low water periods in these regions when fish are concentrated. Illegal drag netting (Fig 1) with monofilament nets and use of banned monofilament nets continue in these systems and also increased in the protected Kwando River system and the Mahangu Park on the Kavango River 72
Lake Liambezi received no water and were practically dried up. Overfishing in the Zambezi-Chobe system resulted in the reduction of catch per unit effort of 9.1kg per net set during 2010 to 3.8kg per net set at the end of 2017, with a resulting decline in total estimated fish landings from 6100 ton during 2010 to 2534 ton at the end of 2017 representing a 58% loss of fish stocks over the period. This trend continue as witnessed during the annual biological surveys of this system during 2019/20. 73
The estimated harvest from the inland fisheries resource (rivers, lakes, dams) for 2019/20 in the Northern Regions of Namibia is around (estimate) 1500 tonnes for the Zambezi-Chobe system and 600 (estimate) tonnes for Kavango and Kunene systems with a total (estimate) inland fisheries landing of 2100 tonnes with a total estimated value of N$ 126 56 million (average fish market price of N$ 60/kg fish at Katima Mulilo fish market).This represent a loss in income of N$30 million due to declining fish populations as a result of over fishing and use of illegal fishing gears (monofilament nets) and illegal fishing methods like drag netting. 73
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List of Abbreviations

ANN	Aquaculture in Northern Namibia
ASPM	Age Structure Production Model
BCC	Benguela Current Commission
CCAMLR	Commission for the Conservation of Antarctic Marine Living Resources
CP	Crude Protein
CPEF	Catch Per Unit Effort
CPP-NNE	Community Based Project-Namibia Nature Foundation
EEZ	Exclusive Economic Zone
EU	European Union
EUS	Epyzootic Ulcerative Syndrome
FIOC	Fisheries Inspector Observer Course
FOA	Fisheries Observer Agency
GDP	Gross Domestic Product
HAB	Harmful Algal Bloom
HIAC	Hardap Inland aquaculture Center
ICCAT	International Commission for the Conservation of Atlantic Tunas
IWP	Individual Wrapped Portion
KIFI	Kamutjonga Inland Fisheries Institute
Km	Kilometre
MANCOSA	Management College of Southern Africa
MCS	Monitoring, Control and Surveillance
MFMR	Ministry of Fisheries and Marine Resources
MSYL	Maximum Sustainable Yield Level
N$	Namibian dollar
n. mile	Nautical mile
NAMFI	Namibian Maritime and Fisheries Institute
NPC	National Planning Commission
OIA	Onavivi Inland Aquaculture
PQ	Prime Quality
PV	Patrol Vessel
RFMO	Regional Fishery Management Organization
RV	Research Vessel
SA	South Africa
SANUMCRC	Sam Nujoma Marine and Coastal Research Centre
SEAFO	South East Atlantic Fisheries Organisation
SG-ASAM	Subgroup Acoustic Survey and Analysis Methods
SSFF	Small Scale Fish Farm
TAC	Total Allowable Catch

UK	United Kingdom
UNAM	University of Namibia
UNDP	United Nation Development Programme
UNISA	University of South Africa
USA	United Stated of America



Foreword



As a Minister of Fisheries and Marine Resources, it's my honor and privilege to present the annual report of the Ministry to the general public at large.

During the financial year 2019-20 GDP increased with 4.9% from 2018 to 2019. The fishing sector contributed N$6,367 billion in 2019 while in 2018 the sector contributed N$6,074 billion. The increase in GDP is attributed to positive growth experienced in terms of landings in demersal sector, particularly from Hake long-line, and monk and sole sub-sector respectively.

I will also like to highlight that part of the success in the fishing sector, is the tireless effort carried out in the Exclusive Economic Zone by joint patrols with law enforcement agencies, such as The Ministry of Fisheries Directorate of Operations, in partnership with the Namibian Police Force Water Wing, the Ministry of Defence Navy and the Sea Shepherd Global carried out vessels patrol to stop illegal fishing which is a commendable point to note.

Aquaculture (Fresh aquaculture and Mari culture continue to produce success and growth interms of capacity and production.

Especially in Mari culture which had a total Mari culture production that was exported from Namibia for the period 2019/2020 was about 188.31 metric tonnes valued at about N$13 million. The main export markets were China, Russia and South Africa.

As part of promoting its staff interms of skills development, various skills development courses were attended by **Ninety one (91)** staff members from various directorates of the Ministry. These included courses on In-house Induction, fisheries, aquaculture, and mandatory courses.

Interms of supporting students at tertiary institutions, the Ministry assisted **Twenty Five (25)** university students to gain job training attachments under the supervision of permanent staff members.

I thank you and hope you find this Annual report fruitful and insightful worth to read.

ALBERT KAWANA (MP)
MINISTER

DRAFT

1. THE MINISTRY OF FISHERIES AND MARINE RESOURCES

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

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1.2 ORGANISATIONAL STRUCTURE

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

1.2.1 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

1.2.2 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.

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1.1.3 Directorate of Policy, Planning and Economics

Main responsibilities:

- Co-ordinates the formulation, implementation, as well as monitoring and evaluation 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.

1.2.4 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 Ministry upholds the standard of Customer Charter, in accordance with the Public Service Charter of Namibia. The Customer Charter was also reviewed to accommodate aquaculture services. The Strategic Plan and Customer Charter can be accessed via the Ministry's website www.mfmr.gov.na

1.4 FINANCE

In terms of Financing the ministry had an allocation of N$ 239, 992,000.00 as indicated in the table below, for the financial year and the execution rate at the end of the year was at 89.69% and this was due to the slow implementation of development budget.

Table 1. MFMR budget allocation 2019/20 financial year (N$000)

Budget	Allocation	Expenditure	% execution rate
Operational	229,282	213,500	93.11%
Development	10,710	1,761	16.44%
Total	239,992	215,261	89.69%

Source: MFMR, 2019/2020

The Ministry's total budget allocation for 2019/2020 financial year is N$ 239,992,000.00. This is broken down into N$ 229,282,000.00 for Operational expenditure and N$ 10,710,000.00 for Capital expenditure. The budget execution of the Ministry as at 31 March 2020 stood at N$ 215,260,326.47. This represent 89.69% of the total budget, as depicted on the table above.

Table 1: Development Budget for 2019/2020

Project	Estimate (N$,000)
1. Renovation of MFMR Head Office in Windhoek	4,000
2. Leonardville Fish Farming Project	710
3. Aquaculture Development Project in Kavango	1,500
4. Upgrading of Keetmanshoop Fonteintjie Fish Farm Community Project	2,500
5. Construction of MFMR Regional Office in Kavango	2,000
Total	10,710

Source: MFMR, 2019/2020

2 FISHERIES RESEARCH

2.2 STATE OF THE MARINE ENVIRONMENT

2.2.1 Upwelling

Wind induced coastal upwelling is the most important oceanographic process along the Namibian coast. Through this process nutrient-rich, cool water moves vertically from depth to the surface where it stimulates primary production in the sunlit zones. This forms the basis of the food chain and is thus very important for secondary production (e.g. zooplankton, fish eggs and larvae). Although increased upwelling increases the supply of nutrients to the surface and thereby primary production, prolonged events can lead to the loss of production through mixing and offshore advection of plankton. During periods of reduced upwelling (relaxed southerly winds), sea surface temperatures increase, leading to vertical density differences and increased thermal stratification. The surface stratified layer benefits both primary and secondary production through improved vertical retention. Resultant thermoclines and fronts further serve as food concentration areas. Wind and sea surface temperatures (SST) are presented below as indices for upwelling variability.

2.2.2 Upwelling Indicators

Wind induced coastal upwelling is the most important oceanographic process along the Namibian coast. Through this process nutrient-rich, cool water moves vertically from depth to the surface where it stimulates primary production in the sunlit zones. This forms the basis of the food chain and is thus very important for secondary production (e.g. zooplankton, fish eggs and larvae). Although increased upwelling increases the supply of nutrients to the surface and thereby primary production, prolonged events can lead to the loss of production through mixing and offshore advection of plankton. During periods of reduced upwelling (relaxed southerly winds), sea surface temperatures increase, leading to vertical density differences and increased thermal stratification. The surface stratified layer benefits both primary and secondary production through improved vertical retention. Resultant thermoclines and fronts further serve as food concentration areas. Wind and sea surface temperatures (SST) are presented below as indices for upwelling variability

2.2.3 Wind

During the past few years wind speed standardised anomalies have been used as a proxy for an upwelling index for the Lüderitz area based on a 60-year time-series of wind speed data



collected at Dias Point. Ideally an upwelling index should incorporate both wind speed and wind direction, and we are presently working towards this final format of an upwelling index for the Lüderitz area. The dominant wind direction off Lüderitz is southerly, and is responsible for upwelling nutrients from the deeper ocean depths to the inshore surface waters and transporting it further north. Standardised anomalies calculated for the wind speed time series show two distinct periods with strong negative anomalies (thus indicating below average upwelling off Lüderitz) at the beginning (1960s and mid-late 1970s) and towards the end (2000s until present) (Fig. 1). The period 1979 to 1992 was characterised by above average wind speed anomalies. From around 1993 to 2004 monthly anomalies fluctuated around the long-term average with no distinct negative or positive trend. However, from 2005 onwards (until the present) wind speed anomalies remained almost consistently below average. In fact, from January 2005 till January 2020, these anomalies have been below average during 154 of the 184 months, thus for 84% of the time. This indicates that the Lüderitz upwelling cell has been in a slackened phase for most of the past 16 years. During April 2019 to March 2020, nine of the 12 months had negative standardized wind speed anomalies. During March, April and August 2019, however, standardized wind speed anomalies were positive. As mentioned earlier, the Lüderitz upwelling winds are crucial in bringing nutrient rich offshore bottom waters towards the inshore surface waters and transporting it further northwards. These nutrients are utilized by phytoplankton further north along the coast, which in turn provides a food source for zooplankton and filter-feeder fish (such as sardines and juvenile horse-mackerel).

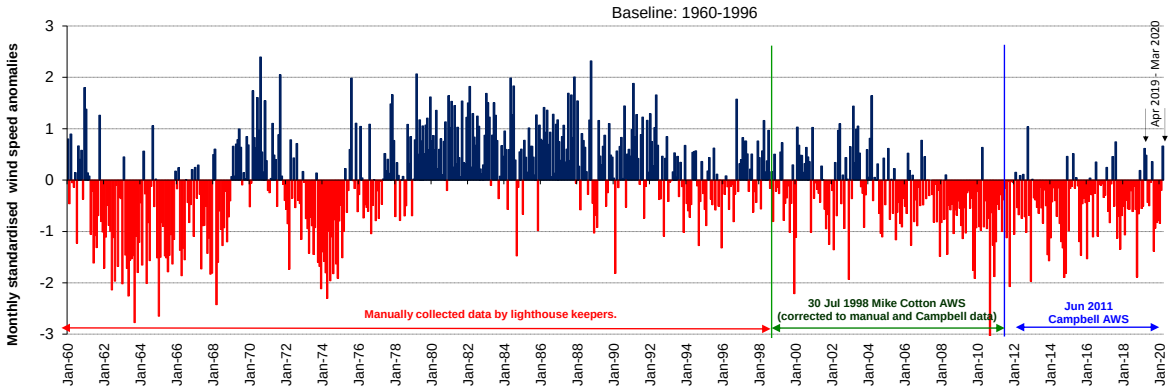


Figure 1: *Monthly wind speed standardized anomalies at Lüderitz (Jan 1960 - Apr 2020). Wind direction not included.*

2.2.4 Sea surface temperature

During summer (February/March) sea surface temperatures off central and northern Namibia usually increase due to a combination of solar radiation and a relaxation in the equator-ward, upwelling favourable wind. The latter initiates the southward shift of warm subtropical water from Angola as well as the inshore advection of warmer oceanic waters from farther offshore.

Summer-autumn period is also the manifestation of the *Benguela Niño* phenomenon (e.g. 1995 and 2011), usually between January/February to April/May, which typically lasts three to four months. The *Benguela Niño* is remotely forced and originates from sustained anomalous atmospheric conditions in the tropical Atlantic, farther north. The time overlap of the *Benguela Niño* and the seasonal warming makes it very difficult to distinguish between the two, but the difference can be inferred from the intensity and duration of the surface warming as well as from *in situ* oceanographic data.

Figure 2 shows the monthly sea surface temperature (SST) anomalies along the southern Angolan and Namibian coastlines since January 1982. During the Benguela Niño of 2011 the SST was up to 3°C warmer than average over the Namibian shelf for more than 3 months. Since then there have been some warm events over the Namibian shelf (notably during summer 2016) but these have been only a few weeks in duration. From July 2018 till the end of January 2019 and again since March 2019, a cooling anomaly of between 0.5-3°C has persisted over the entire Namibian shelf, most likely caused by the above average wind speeds recorded in Lüderitz during March/April and August 2019. SST averaged out again in October 2019. A positive anomaly was present over northern Namibia during December 2019 but did not continue into January 2020. The SST was average during the first quarter of 2020.

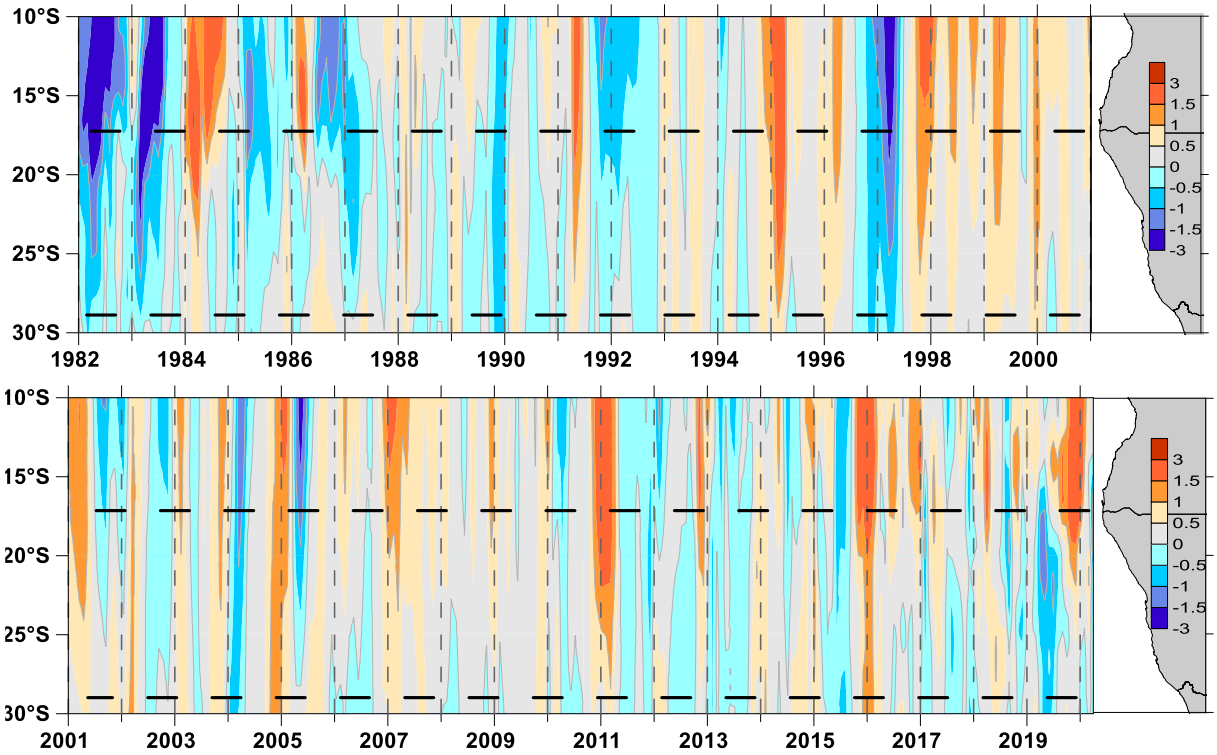


Figure 2: *Time-series of monthly SST anomalies along the southern Angolan and Namibian coastline (1982 – March 2020).*[1]

2.2.5 Oxygen Index (Central Namibia)

Dissolved oxygen measurements from the 23°S line sampled during both the national oceanographic monitoring surveys as well as during international research cruises have been used to calculate an oxygen index for the central Namibian shelf (% area of water column ≤0.5ml/l O_2) from 1999 to February 2020 (Fig. 3a). A seasonal trend can be seen in the time series – lower oxygen levels during summer/autumn and higher oxygen concentrations with the onset of winter/spring upwelling. Although the same trend is seen throughout the time series it does show inter-annual variability such as the oxygenated bottom water conditions experienced over the central Namibian shelf during 2004 versus the persistent low bottom oxygen levels from 2000 to 2001. There was a 7-month sampling gap for the 2018 winter/spring period due to cancellation of these oceanographic monitoring surveys, but the November 2018 index value indicates that the central Namibian shelf had been ventilated. By autumn 2019 some low-oxygen water was present over the shelf and data from the German *RV Meteor* indicate that spring ventilation had set in by end August 2019. In February 2020 the low-oxygen water area had increased to 19% again.

[1] NOAA NCEP EMC CMB GLOBAL Reyn_SmithOIv2 monthly SST data extracted from the IRI/LDEO Climate Data Library

A record of near bottom dissolved oxygen and temperature measurements (September 2013 to August 2019) from a long-term mooring along the Walvis Bay monitoring transect illustrates the considerable seasonal and inter-annual variability of the shelf dissolved oxygen levels (Fig. 3b). Much of this variability was captured previously by the regular oceanographic surveys; however, due to cancellation of surveys at crucial periods during the shelf dissolved oxygen cycle in recent years, the oxygen seasonality has not been adequately covered. The mooring time series verifies both the extended anoxic conditions over the central shelf in autumn 2017 as well as the strong ventilation of the Namibian shelf during spring 2018 followed by reappearance of low-oxygen bottom waters in autumn 2019 and again briefly in winter 2019.

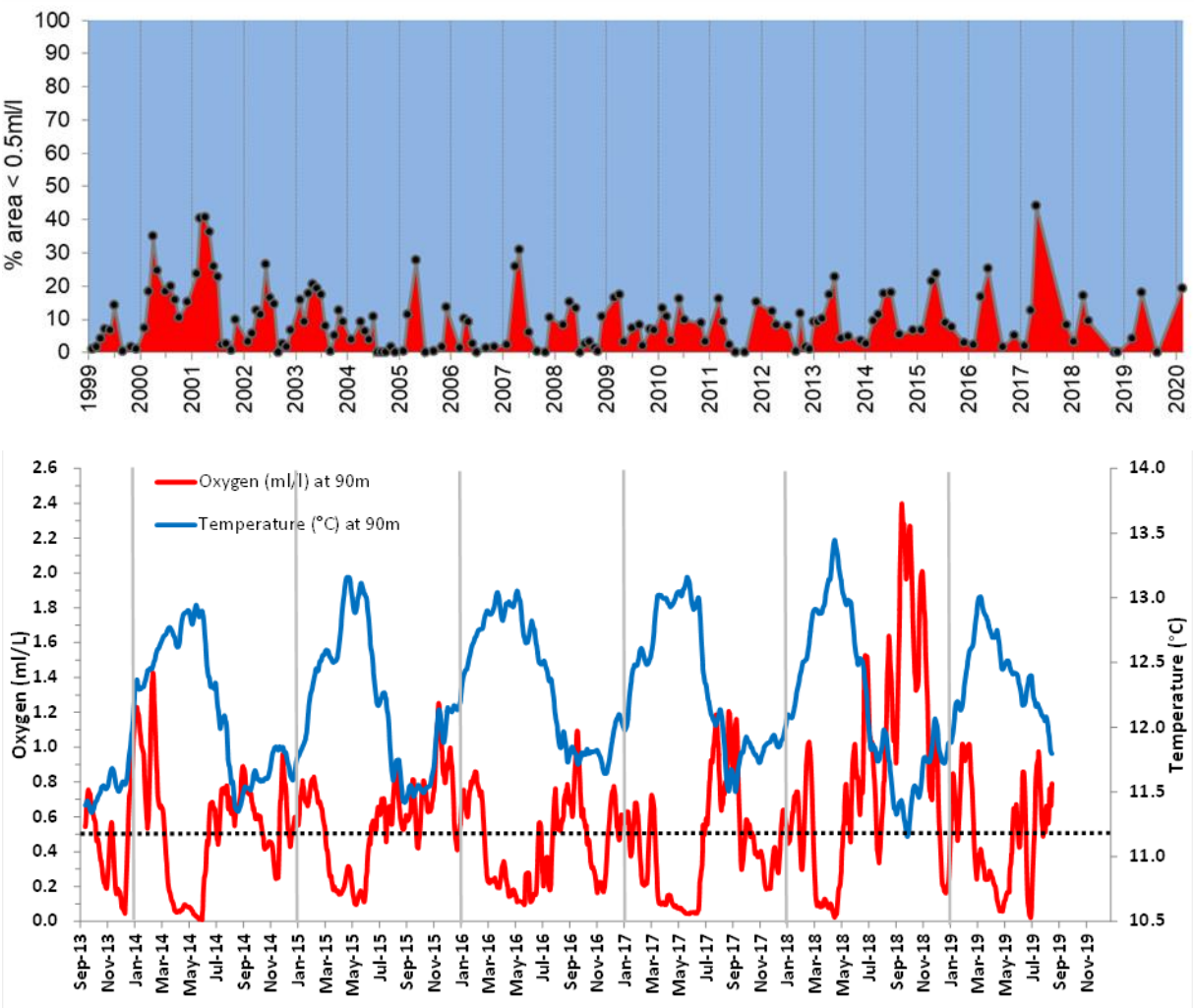


Figure 3 : *a) Percentage area of the water column with dissolved oxygen content ≤0.5ml/l on the central Namibian shelf (2-50nm). b) Time series (ten-day running average) of dissolved oxygen and temperature at 90m depth from a mooring 20nm off Walvis Bay (23°S).The dotted black line indicates the 0.5ml/l low-oxygen water threshold. (Note: Mooring data originates from an IOW, Germany mooring maintained via a collaborative project between the IOW and MFMR.)*

2.2.6 Plankton

Plankton productivity forms the basis for the marine food webs and determines the energy flow to higher trophic levels such as fish. The enrichment of the surface water through upwelling of nutrients stimulates phytoplankton growth (primary production). This is followed by secondary production, consisting of zooplankton and ichthyoplankton (fish eggs and larvae). Both phytoplankton and zoo-/ichthyoplankton are important food sources for many fish species during different stages of their life cycle.

2.2.7 Phytoplankton

A satellite-derived chlorophyll-a index, representing chlorophyll-a concentration (an indication for primary production - food for zooplankton and filter feeding fish) along the Namibian coast is shown in Figure 4. Highest chlorophyll-a concentrations usually occur off central Namibia, downstream of the Lüderitz upwelling area. The upwelling centres, e.g. Lüderitz, usually have low chlorophyll-a concentrations due to the intense turbulence in the water column during active upwelling. The concentration of chlorophyll-a along the Namibian coast, was relatively low in 2005, 2006 and 2011, whereas high concentrations of chlorophyll were seen off the northern part of the Namibian coast in 2003, 2008, 2010, 2015, 2016 and 2017. During 2019 strong blooms off central and northern Namibia were observed. Since the beginning of 2020 moderate blooms can be seen off Namibia.

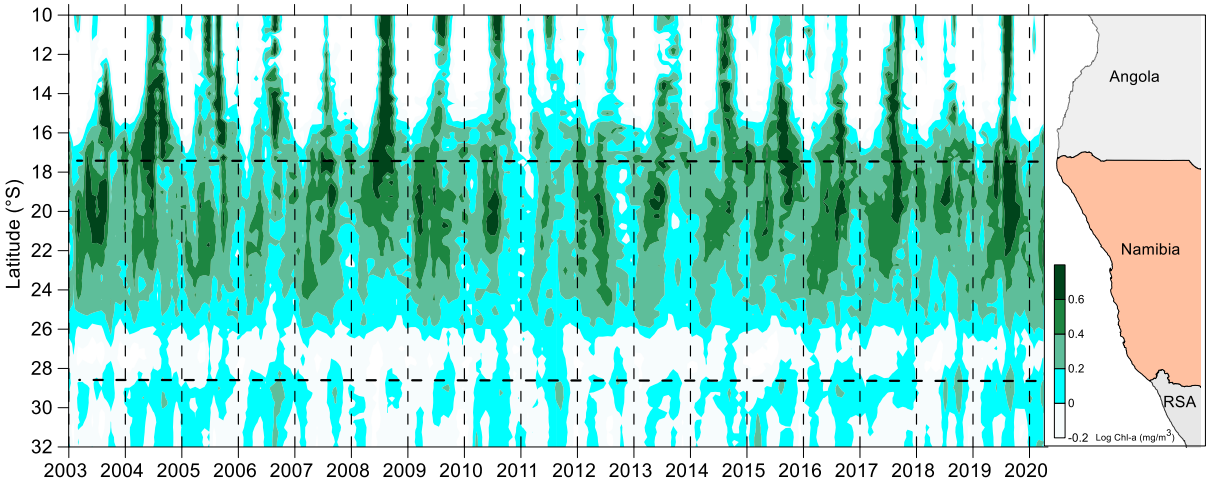


Figure 4 : *Monthly average chlorophyll-a concentration (log mg/m³) from January 2003 – April 2020.*[2]

[2] *Data extracted via the Giovanni online data system, developed and maintained by the NASA GES DISC.* ***Please take note that the MODIS satellite data should be used with caution because it is not validated anymore.***

2.2.8 Zooplankton

Copepods are the most important members of the zooplankton community and are good indicators of ecosystem change. Copepod abundance, calculated from the monitoring line off Walvis Bay (23°S), provides an indication of secondary production and general feeding conditions off central Namibia. Peak abundances occur during spring and summer months approximately eight weeks after the onset of upwelling.

Long-term trends show that copepod abundances of this time series, which started in 2000, are much higher than historic abundances. Copepod abundance anomalies are shown in Figure 5. The index shows two distinct periods with abundances below the time series average (i.e. negative anomalies in red) during 2000-2001 and 2005-2011. Strongest negative anomalies during this time series were observed between 2008 and 2011. The period 2002-2004 was characterized by above average abundances (i.e. positive anomalies in blue). Since 2012 abundances fluctuated around the average of the time series, but are still higher than historic abundances. Overall, copepod abundance shows a high monthly, seasonal and inter-annual variability over the time series. Due to the cancellation of most of the monitoring surveys during recent years and resulting lack of data, it is very difficult to identify long term trends using an index with high short term variability.

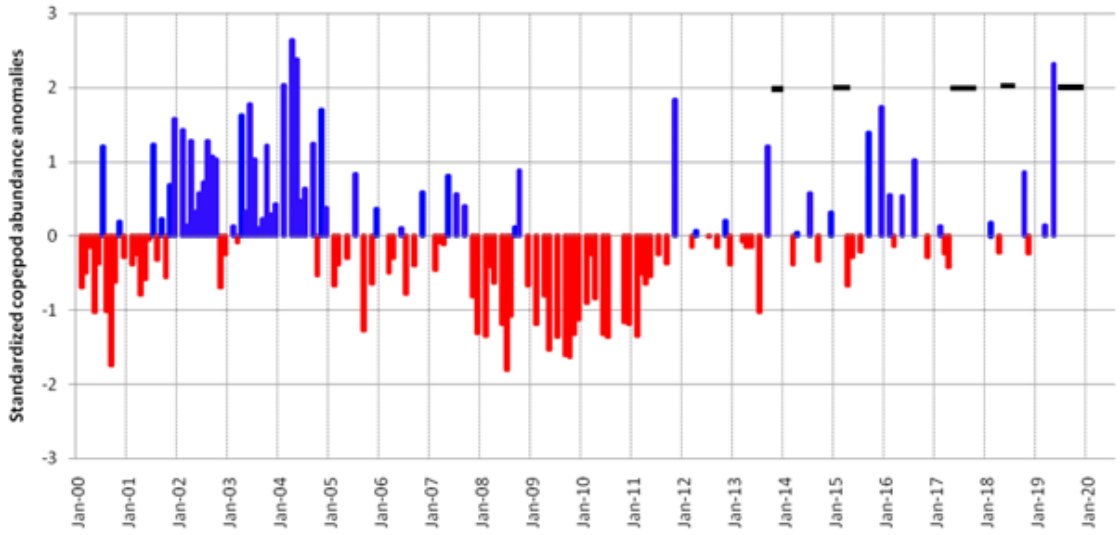
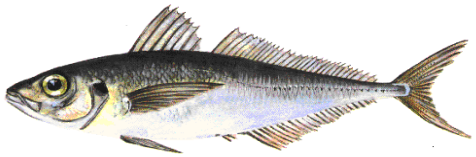


Figure 5: *Monthly standardized copepod abundance anomalies on the 23°S transect (10nm to 70nm from the shore) from February 2000 to May 2019. Blue bars indicate months with copepod abundance above the average (i.e. positive anomalies). Red bars indicate months with copepod abundance below the average (i.e. negative anomalies. (▬) indicates 'no data'.*

2.3 STATE OF MARINE RESOURCES

2.3.1 Horse Mackerel

Trachurus capensis



In 2019, the horse mackerel stock was estimated at approximately 1 423 000 tonnes, which is above the MSY level. The population length frequency distribution increases with latitude and bottom depth. The length frequency distribution (total) ranged from 2 cm to 32 cm with modal lengths of 6 and 17 cm. Given that the dominant component of the stock consists of fish less than 6 years old caution need to be taken to ensure sustainability. Furthermore, the average length at 50% maturity over the last decade has decreased to 18.5 cm relative to that in the seventies of 25.9 cm, generally a consequence a of continuous heavy.

A total allowable catch (TAC) of 349 000 tonnes was allocated for the 2019 fishing season, of which 296 000 tonnes were landed. Fishing activities were concentrated to the central to northern region. The annual average midwater catch-per-unit effort (CPUE) was approximately 13.3 tonnes/hour. The length frequency distribution of fish in the catches ranged from 12 to 39 cm with a modal length of 21 cm.

2.3.2 Sardine (pilchard)

Sardinops sagax



Due to a three-year moratorium imposed on sardine fishing since January 2018, no TAC was allocated and hence no purse seining activities took place in the 2019 fishing season. However, by-catches of sardine and other small pelagic fish (anchovies and round herring) by the midwater fisheries were received, indicating a length frequency distribution ranging from 16 to 24 cm, which are individuals that are maturing.

No sardine directed surveys were conducted during the moratorium, but data from the small pelagic surveys indicate that the stock is still virtually at a zero biomass, underscoring that the stock is struggling to rebuild to biologically and economical sustainable levels. Therefore, the stringent management measures in place need to be continued to allow the stock to make a significant recovery.

2.3.4 Cape fur seal

Arctocephallus pusillus pusillus



The latest (2019) assessment estimated the seal population at around 1.365 million, which is expected to remain above this level under the current harvesting strategies. Seals are found on 26 colonies along the Namibian coastline, of which four are harvested. The distribution of the population is known to have shifted northwards due to prey availability. With the decline of commercial pelagic stocks the proportion of non-commercial species (e.g. goby, *Sufflogobius bibarbatus*) has increased in seal diets in the northern Benguela ecosystem in recent years. However, stock indicators, such as average birth weight, was below the long-term levels which is an indication of poor feeding condition of pregnant cows, and thus lowering the early survival chance of pups.

During the 2019 harvesting season, the sealing industry harvested 9% and 91% of the allocated 60 000 pup and 8 000 bull TAC, respectively. Harvesting took place both in the northern colonies (Cape Cross and Torra Bay) and southern colonies (Atlas and Wolf Bay).

2.3.5 Large Pelagics

Tuna, swordfish & large pelagic sharks



The large pelagic fishery consists of a Bait boat Fleet targeting tuna (mainly albacore, big eye and yellowfin tuna) and a Pelagic Longline Fleet targeting swordfish and large pelagic sharks (mainly blue shark and shortfin mako). All catches of sharks, billfish and tuna species are recorded and reported to ICCAT. For 2019, bait boat landings reported were 205.6 t albacore and 38.2 t bigeye tuna, whereas, longline boats landings reported 811.3 t of swordfish, 5456.6 t sharks, 54.7 t albacore, 41.2 t bigeye tuna, 52.77 t blue marlin and 81.76 t yellowfin tuna (figure 1).

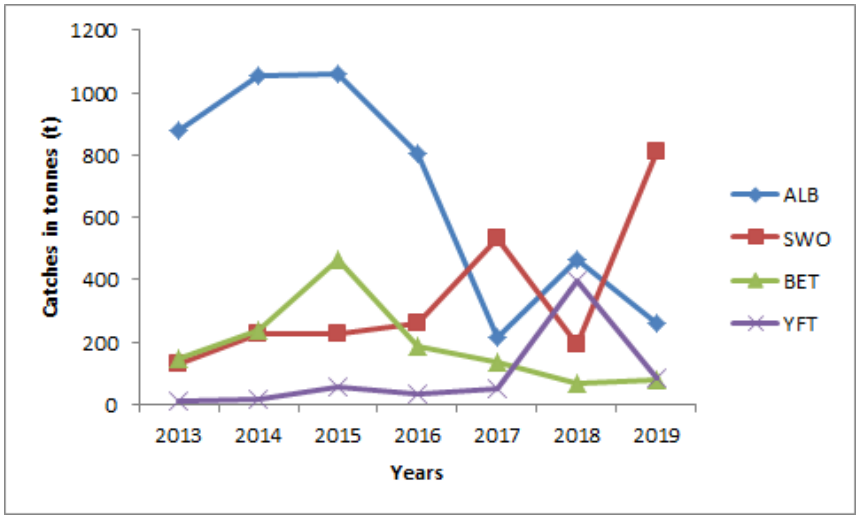
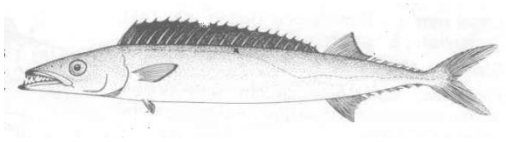


Figure 6 : *Catch trends of large pelagic fisheries in recent years.*

2.3.6 Line boat Sector:

Snoek (*Thyrsitess atun*)



Snoek is a highly migratory and seasonal species, which is not managed by an annual TAC. Therefore, vessels targeting this species are permitted to catch as much as possible during the harvesting season.

In 2019, 2 517.4 t of snoek were caught with the highest (633.3 t) reported in February and the lowest (68.7 t) in September (figure 2). No catches were reported in July and August. Catches are expected to be low during the winter months (June – August) due snoek seasonal migratory cycle.

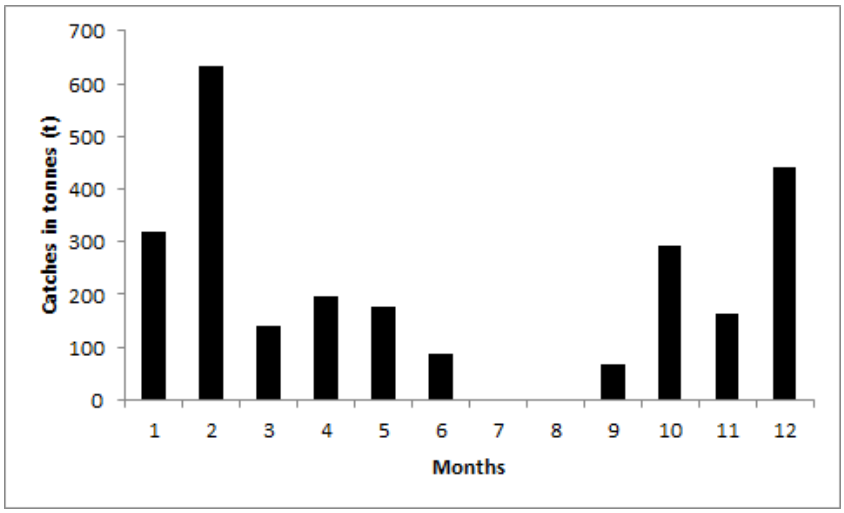


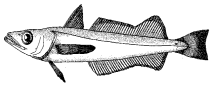
Figure 7: *Monthly snoek catches.*

2.3.7 RECREATIONAL SECTOR:

The Namibian marine environment supports a highly esteemed recreational fishery. The fishery is exploited by both local and international anglers targeting a wide range of linefish species. The angling season runs from October to September, however, no data was recorded for the fishing season due to constraints.

HAKE

Merluccius capensis and M. paradoxus



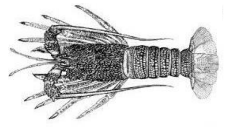
No scientific survey was conducted to estimate the relative biomass and associated biological paraments of hakes during 2019, due to vessel related logistics.

However, the catch rates (CPUE by bottom trawlers, which is also used as an index of stock abundance has slightly decreased from 1306 kg/hr during 2017 to 1242 kg/hr during 2018, while the Long liner CPUE has decreased from 0.074 to 0.059 (kg/(hook set*hrs) during the two respective years. The bulk of the commercial catches during 2018 were made up of 24% *M. capensis* and 76% *M. paradoxus*, by weight with the mean length of *M. capensis* having increased from 31 to 35 cm while that of *M. paradoxus* decreased from 38 cm to 36 cm during 2017 to 2018 respectively.

The last assessment in September 2019 estimated the Namibian hake stock to be above the state of the stock in 1990 (which is the first and the limit reference point), while the overall stock indicator was estimated to still be biologically unsustainable, i.e. the spawning stock biomass (B_{sp}) is below the spawning stock biomass at maximum sustainable yield (B_{spmsy}) level (which is the second and target reference point). Hence the hake stock still needs to be rebuilt to this biological sustainable reference point (B_{spmsy}), as also required for MSC Certification. Recent harvesting levels are however below the replacement yield (RY) and that should allow the stock to rebuild to B_{spmsy} level. Analysis of the rebuilding timeframe conducted during 2019 showed that at current harvesting level, the hake stock can be rebuilt to 55% of the B_{spmsy} in the next eight years.

ROCK LOBSTER

Jasus lalandii



During 2019 only 1 out of the 12 planned lobster survey was conduct as *RV !Anichab* was not available due to technical issues. Nonetheless, the seasonal fishing effort remained unchanged over the last two seasons but with the decrease in the 2018-19 seasonal catch of 29%, the seasonal CPUE decreased by 23% from the 2017-18 to the 2018-2019 season. By the end of the season the rock lobster commercial fleet only managed to land 63% of the 2018-19 quota.

Biological data revealed no changes in population structure and the average size of samples taken from various lobster fishing grounds. However, the decreased catch rates during the 2018-19 season resulted in a moderate decrease in the new recruit and a minor increase in the

full recruit estimates. These decreases translated into a 6% decrease in the fishable biomass estimates for 2019. The rock lobster stock continues to show evidence of a stock under pressure, considering that on average 80% of lobsters caught are of sub-legal sizes, and had to be returned to sea, where they may not survive due to exhaustion, damages and predation.

DEEP-SEA RED CRAB

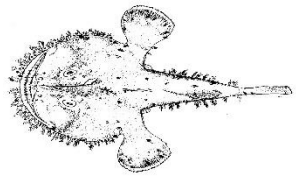
Chaceon maritae



The 2019 scientific survey estimated a 42% and 16% increase in the biomass and recruitment abundance respectively since the 2017 survey (the 2018 survey did not take place). During the 2018 fishing season, there was an overall decrease in the seasonal catch rate (CPUE, kg/trap). Biological indicators remained fairly unchanged over the last two seasons (2018-2019), although there was an increase in the total number of male crabs caught during the 2018 season, which may have contributed to the increase in the overall biomass estimates. Overall the deep-sea red crab appears to be biologically sustainable.

MONKFISH

Lophius vomerinus



There was no scientific survey for the monkfish resource during 2019, due to the unavailability of the *RV Mirabilis*. As a result, no biological parameters, such as relative total biomass, size structure, maturity and recruitment could be estimated. Data from logbook indicated a slight increase in the catch rates (CPUE) for 2019, while the size structure showed an overall decrease in fish length landed during the same period. Results from the Age-Structured Production Model (ASPM) conducted in March 2020, show that the recent harvesting levels are below the sustainable level and there was less than 1% growth in the total biomass since the 2019 assessment. Overall, the monkfish stock has been assessed to be biologically sustainable, i.e. the spawning stock biomass (B_{sp}) is estimated to be above the spawning stock biomass at maximum sustainable yield (B_{spmsy}).

ORANGE ROUGHY

Hoplostethus atlanticus



The Orange roughy annual biomass survey resumed in 2016 and was conducted since then, after eight years of no research following a moratorium on fishing in March 2008. A combined swept-area and hydro-acoustic methodology was used during the surveys. A total estimated biomass of orange roughy from six aggregation grounds in 2019 was 59 988 tonnes, representing a 123% increase from 2018 estimated from four grounds. A gradual decline in the mean length distribution of orange roughy from the northernmost ground

(Hotspot) to Pavs in the south was observed during 2019 as in the previous year. A model assessment was attempted but the model did not converge, due to the large gap in input data and hence more data will be collected to enable stock assessment.

TOP PREDATORS

Namibia's populations of both African penguins and Cape gannets have declined drastically mainly due to a lack of food, such as sardine and anchovy. Both species are endangered according to the IUCN Redlist. The situation of the African penguin was worsened by the outbreak of avian flu on Halifax Island, one of the largest breeding colonies, where more than 400 African penguins died in late 2018/early 2019 (Fig. 6).

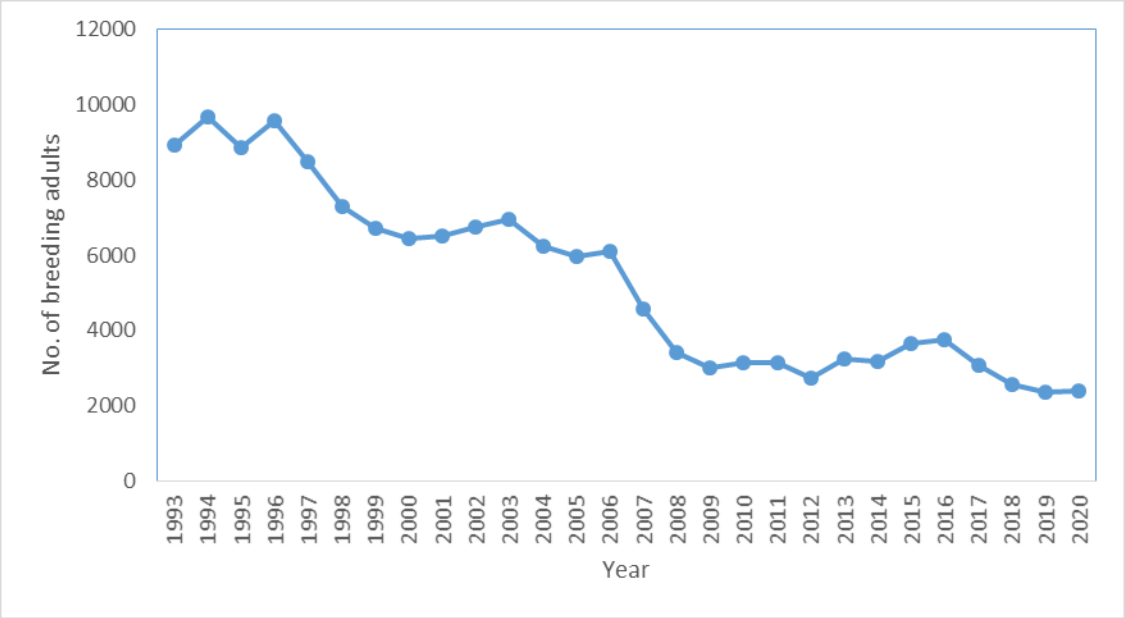


Figure 8: *Total number of breeding adult penguins on Halifax Island between 1993 and 2020.*

3 MONITORING, CONTROL AND SURVELLANCE (MCS)

The Team on the Ocean Warrior, comprising Fisheries Inspectors, some of the Ocean Warrior Crew and Members of the NAMPOL Water Wing while on sea Patrol in the EEZ (2019)



Source: MFMR 2019/2020

3.1 DIRECTORATE OF OPERATIONS

The Directorate of Operations is mandated to regulate the fisheries activities within the two hundred (200) nautical miles Exclusive Economic Zone (EEZ) and public inland water bodies. The functions of the Directorate are organized into two divisions, Technical Services and Monitoring, Control and Surveillance.

3.1.1 DIVISION OF TECHNICAL SERVICES

The Division of Technical Services is assigned with the administration and management of the Fisheries Patrol and Research Crafts in support of the Directorate of Operations and that of Resource Management to carry out their mandates. During the reporting period, the division was responsible for the following crafts:

Vessels:

Two (2) Fisheries Patrol Vessels (FPV's):-	FPV Nathaniel Maxuilili and the FPV Anna Kakurukaze Mungunda, and
One (1) Fisheries Research Vessel (FRV):-	FRV Mirabilis

Fixed wing aircrafts:

Two (2) fixed wing patrol aircraft namely: - Sea Eagle I and Sea Eagle II

The division is responsible for the maintenance and the operation of all crafts as well as for all logistics pertaining to the supply of fuel, lubricants, and other provisions, to ensure readiness of the crafts if and when required.

3.1.2 Sub-division Vessels: Status of the Vessels

Is responsible for maintenance, repairs and major dry-dock of the vessels as well as the logistics and supply of fuel, lubricants and provisions. In addition, the subdivision is accountable for the safe manning of the vessels.

Whereas, the air wing subdivision is in charge of maintenance, repairs, logistics and supply of Jet A1- fuel, rations and safe manning of the air craft

The financial constraints that started during previous reporting periods continued to hamper the operations of the division, which was further exacerbated by the introduction of the new procurement system. During the period under review, all vessels required routine major maintenance, as well their annual service and inspections.

The FPV Nathaniel Maxuilili underwent her Annual Class Survey by Det Norske Veritas (DNV) and the certificates were endorsed. However, two conditions of the class were issued for malfunctioning of the fire detector on the bridge and collapse RPM reading port panels in the engine room, which were still awaiting parts, deliver, from Europe, at the end of the reporting period.

Due to the maintenance delays and other, the delays caused by multiple of issues such as the financial constraints and the new procurement system the FPV Maxuilili could only be sent out on 3 fisheries patrol missions during the reporting period, but was operational ready at the end of the period.

The FPV Mungunda, which was as not operational during the previous reporting period, and the FRV Mirabilis had to be dry docked for major repairs and maintenance during the reporting period, with the Mirabilis also having to undergo the 16,000 hours service. The routine maintenances are conducted to ensure the seaworthiness of the vessels.

The FRV Mirabilis, annual Class Survey and bottom inspections was carried out by Bureau Veritas (BV) during the dry dock period whereas, annual safety equipment and Radio inspection was also carried out after the completion of vessel's dry dock. Both safety and fire-fighting equipment were sent for annual servicing and inspection. Generally, the vessel machinery and other equipment are in good working condition with the exception of the coupling for the portside shaft generator was order and was still awaited at the end of the reporting period. The vessel's drop keel also required attention at the end of the reporting period, which made the vessel not ready for operations at the end of the reporting period.

The FPV Mungunda, was able to carry out only one fisheries patrol towards the end of the reporting period, and was operational ready thenceforth. The table below provide a breakdown of the activities carried out by each vessel during the reporting period.

Table3: Statistics per Vessel for the period under review

Activity/Item	*FPV N Maxuilili*	*FPV A K Mungunda*	*FRV Mirabilis*
Number of Voyages/ Mission	3	1	3
Days at Sea per annum	42	21	47
Distance Covered (nautical miles)	5,186	2,708	6,563
Fuel received (litres)	124,317	280,288	504,988
Fuel Consumed (litres)	123,460	56,900	*349,939*
Fuel Remaining (litres)	857	210,317	155,049

1.1 AIRWING SUBDIVISION (PATROL AIRCRAFT)

The financial constraints continued through the reporting period and rendered the Sea Eagle I, virtually inoperable during the reporting period. The aircraft had problems with its Global Positioning System (GPS) which caused mainly by the database subscription, which was not up to date due to non-payment.

At one time, both aircraft's databases expired, due to none payment, causing errors on the Flight Management System (FMS). Although, the financial constraints were addressed, at the end of the reporting period, both aircraft were grounded as the crew life raft were sent to the USA, for certification.

The table below provide a breakdown of the activities carried out by each aircraft during the reporting period.

Table 4: Activities of the Aircrafts for the period under review

Activity/Item	*Sea Eagle I*	*Sea Eagle II*
Number of Voyages/Missions	*7*	*35*
Hours flown per annum	*16*	*110,25*
Distance Covered (km)	5,832	*20,899*
Fuel Consumed (litres)	3,570	33,887

1.2 MANDATORY TRAINING AND SAFETY COURSES

During the reporting period, the division ensured that all mandatory courses were validated and the continuation with the courses were adhered to, including safety courses. In addition, Safety drills were conducted to ensure the crew readiness in handling different emergencies that could occur on the vessels.

2 Marine Monitoring, Control and Surveillance (Marine MCS)

2.1 SEA PATROL ACTIVITIES

The good co-operation that was established between the Ministry and other Law Enforcement Agencies of Government, the Ministry of Defence Navy and the Namibian Police Force Water Wing, continued to be strengthened during the reporting period. Most, if not all patrol missions undertaken were by Fisheries Inspectors with either Naval Officials or Police Officers.

During the period under review, the division carried out seven (7) see patrol mission of which four (4) were carried out using the ministerial fisheries patrol vessels and three (3) were carried with the patrol vessel "Ocean Warrior". The "Ocean Warrior", which was provided by Sea Shepherd Global, through a Memorandum of Agreement between the Ministry and Sea Shepherd Global and Stop Illegal Fishing, to assist in deterring Illegal Unreported and Unregulated (IUU) fishing activities within the EEZ during the period the ministerial vessels were under-going maintenance. While operating in the Namibian EEZ, the "Ocean Warrior" had several Namibian Law Enforcement Officers drawn from the Water Wing of the Namibian Police Force and Fisheries Inspectors.

Patrol missions carried out during the period under review, covered the length and breadth of the Namibian EEZ, however, the majority were focused along the northern maritime border where IUU activities were reported. During the period under review, although various foreign vessels were observed fishing just outside the Namibian EEZ, along the northern maritime boarder, only one vessel, the MFV Forcadela, an Angolan Trawler, was encountered fishing inside the EEZ (very close to the boarder).

Fisheries Inspectors, accompanied by Police officers, that formed part of the particular patrol mission, boarded the target vessel for inspection. Unfortunately, during the inspection, the MFV Forcadela drifted back into Angolan waters. The inspection was then aborted due to jurisdiction matters, and the Inspection team issued a written warning to the Captain of the vessel and return to the mother ship. The table below provide a summary of the patrol results for the period under review.

Table 5: Summary of Sea Patrol Results for the period under Review (Fines are only issued to Namibian registered vessel captains)

Activity	*FPV MAXUILILI*	*FPV MUNGUNDA*	*Ocean Warrior*	*Total*
Boarding and inspection of Namibian registered fishing vessel	11	0	3	**14**
Boarding and inspection of foreign fishing vessels	0	0	1	**1**
Total Fines issued:	**2**	**0**	**0**	**2**

Activity	*FPV MAXUILILI*	*FPV MUNGUNDA*	*Ocean Warrior*	*Total*
Fail to enter records or information in English	1	0	0	**1**
Fail to have up-to-date drawings	1	0	0	**1**
Other	0	0	0	**0**
Warnings issued	**2**	**0**	**1**	**3**
Fail to Maintain Trip Management Book	1	0	0	**1**
Fail to add Fisheries observer in Crew List	1	0	0	**1**
Other	0	0	1	**1**

AIR SURVEILLANCE

Forty two (42) Surveillance flights were conducted while thirty-six (36) were cancelled due to technical problems such as Instrumental and Radar failure and or expired Pilot license. During the Surveillance missions, whenever a suspicious vessel is observed the Fisheries Inspectors takes pictures of identifying features of the vessel and report the matter to Fisheries Operations room for further action.

During the period under review, the surveillance mission reported two (2) sightings of illegal fishing activities along the northern maritime border. These vessels—had no visible identifying features. Generally, whenever, foreign vessels see the patrol aircraft they tend to move further from the border.

COASTAL MCS ACTIVITIES

During the period under review, the regional inspectorate offices undertook one thousand six hundred and thirty eight (1,638) daily coastal MCS patrols of which 922 was undertaken by Walvis Bay and 716 by Lüderitz, along the entire Namibian coastline covering a total distance of 305,580 km. In addition, thirty-two (32) roadblocks were carried out, jointly, with the Namibian Police, Immigration, and Traffic officers during Easter and festive season.

Table 6: Coastal MCS Fleet Running Cost, for the period under review.

Distance Travelled (km)	Service/Repairs Cost(N$)	Fuel Consumed (litres)	Fuel Cost (N$)
305,580	231,330.36	32,801.10	419,284.42

During the above MCS operations, Fisheries Inspector issued a total of one thousand one hundred and thirty one (1,131) fines, of which 808 was issued by the Walvis Bay Office and

323 by Lüderitz, amounting to N$417,020.00, for violating the fisheries legislation. Fisheries Inspectors also arrested six (6) perpetrators for serious acts of violating the Marine Resources Act, Act 27 of 2000, and Regulations of 2001.

Table 2: Details of the Arrests

Offense/Charge	Court District	Nationality / Gender	Court Result
1. Illegal possession and intention to trade or having 18 Rock Lobsters without a right, exploratory right, quota or license	Swakopmund	Namibian/Male	Case still pending at end of review period
2. Illegal possession & intended trade having 30 Rock Lobster without a right, exploratory right, quota or license	Walvis Bay	Chinese/Male	Case still pending at end of review period
3. Possession of 218 White Mussels in Excess of which 12 were undersize	Swakopmund	Namibian/Male	Accused fined N$5,750.00
4. Harvesting and retaining 168 Kobs without a recreational fishing permit of which 146 Kob were undersize.	Swakop	3 Namibian/Males**	Case still pending at end of review period

** The three individuals were arrested with the help of Police Reservists

The table below provide a summary of all fines issued for violations recorded by the Fisheries Inspectorates during period under review, which includes all violations detected through own means as well as those reported to the Ministry by the Fisheries Observer Agency (FOA). As per its establishing instruments the FOA, reported eleven (11) violation of which eight (8) were from the Walvis Bay office and three (3) from Lüderitz, to the Fisheries Inspectorate for investigation and action. All reported cases were concluded successfully by the end of the reporting period.

Table 7: Total number of fines issues for violations reported to the Fisheries Inspectorate during period under review.

Violation Type	Number of Fines Issued			Total Fine (N$)
	Walvis Bay	Lüderitz	Total	
In possession of prohibited annelid worms	375	0	375	154,500
Fishing without Recreational Fishing Permit	165	20	185	55,500
Undersize Fish	139	0	139	37,600
Undersize White Mussels	95	0	95	40,180
White Mussels in Excess	7	0	7	6,040
Harvest limpets more than daily bag limit	0	196	196	58,800
Undersize Rock Lobster	7	18	25	14,700
Rock Lobster in berry	0	1	1	300
Harvest rock lobster without scoop net	0	1	1	300
Exceed the 7 daily bag limit for rock lobster	0	14	14	4,200
Selling fish caught for recreational purposes	0	21	21	6,300
Harvest rock lobster in marine protected area	0	4	4	1,200
Enter Penguin Island without valid permit	0	2	2	600
Black mussel in Excess	1	0	1	2,200
Rock lobster in Excess	4	0	4	7,800
Fish (Kob) in Excess	5	0	5	1,800
Fish not in whole state	2	0	2	1,200
Obstruct/intimidate Fisheries Inspector	1	0	1	1,000
Mullet operate without license	2	0	2	600
Mullet operate in unauthorized area	1	0	1	3,000
Transport without RFP	3	0	3	4,500
Enter reserve area illegally	1	0	1	1,000
Not carrying original documentation on board vessel	0	35	35	10,500
Fishing gear not properly marked	0	7	7	2,100
Fail to carry a Fisheries Observer on board the vessel	0	2	2	600
Fail to Carry MRA and/or MRR	2	0	2	600
Dumping of juvenile fish	0	1	1	1,500
Intimidate a Fisheries Observer	1	1	2	600
Left port without clearance certificate issued by inspector	0	2	2	600
Total	**811**	**325**	**1,136**	**419,820**

By the end of the review period a total of N$193,590 was paid in admission of guilt fines of which N$96,690 was from Walvis Bay and N$ 96,900 from Lüderitz.

During the reporting period, the Division also received two hundred sixty four (264) warrants of arrest from magistrate courts for execution, stemming from the fines issued for which acceptance of guilt was not paid. Unfortunately, not a single one was executed due to unavailability of vehicles because of financial constraints.

During MCS operations, fish found to have been caught in contravention of the legislations is confiscated and kept in storage until the matter is finalised. Once the matter is finalised, those that are found to be fit for human consumption are donated to needy and vulnerable groups whilst those that are unfit are destroyed as per local authority regulations.

Table 8: Venerable Groups that benefited from confiscated Fish, during the reporting period

Name of Institution:	Quantity donated:	Region / Place:
1) Huisen Soup Kitchen	Kob (56 individuals)	Swakopmund
2) Pots of Hope	Galjoen (23.8kg), Crayfish (21.0kg)	Kamanjab
3) JP Brand Primary School	Mullets - 121.60 kg, Cobs, Steenbras & Galjoen 36.70kg	Utuseb settlement outside Walvis Bay
4) St. Boniface Anglican Church	Kob (16.15kg) ,Galjoen (10.05)	Swakopmund, Erongo

SEAL HARVESTING

Seal harvesting operations took place at the Cape Cross Reserve and Torra Bay colonies, in the Skeleton Coast, as well as at the Wolfs Bay and Atlas Bay colonies in the south. During the seal harvesting season a total number of 5,122 Pups and 7,465 Bulls and 4 Cows were harvested.

During the MCS activities of the Seal Harvesting Operations one operator, at Wolfs Bay was fined (and paid) for failing to comply with harvesting quota conditions.

Table 9: Number Seals harvested during the reporting period

Inspectorate Office	Colony	Pups	Bulls	Cows	Total
Walvis bay	Cape Cross Reserve	2,114	5,200	3	**7,317**
Lüderitz	Wolfs Bay and Atlas Bay	3,008	2,265	1	**5,266**
Total		**5,122**	**7,465**	**4**	**12,583**

MARINE FISHERIES MONITORING

The Namibian Fisheries Monitoring Centre (FMC) is based in Walvis Bay and hosts the Vessel Monitoring System (VMS), which enables the tracking of all licenced vessels at all, times.

During the reporting period, the FMC was visited by the following delegations; (i) a delegation from Kenya, (ii) a delegation of UNAM students; (iii) a delegation of the best performers from Ongha Senior Secondary School and (iv) a delegation of students from NAMFI. All delegations are briefed about the functions of the Namibian Fisheries Monitoring Centre and a demonstration of the tracking system.

VESSEL MONITORING

In line with the Vessel Monitoring Regulations, all licensed fishing vessels above 24 metres must be equipped with functional VMS. During the period under review, a total of one hundred fifty six (156) fishing vessels, *that were licensed*, were captured on the system and were monitored and tracked by the VMS Operators in the FMC.

During the reporting period, all licensed fishing vessels complied with having a functional VMS on board and all had Automatic Location Communicator (ALC) devices on board which enabled a 100% coverage and or tracking of the fleet.

Table 10: Per fishery, listing of vessels captured on VMS during the reporting period.

VESSELS TYPE	NUMBER OF VESSELS CAPTURED	ALC'S	ACTIVE	INACTIVE
Hake Wet Trawlers	43	43	43	0
Hake Freezers Trawler	13	13	13	0
Hake Long Liners	13	13	13	0
Midwater Trawlers	20	20	20	0
Monk & Sole	16	16	16	0
Tuna Long lines	34	34	34	0
Tuna Pole & Line	6	6	6	0
Purse Seiners	6	6	6	0
Crab	5	5	5	0
TOTAL	**156**	**156**	**156**	**0**

VESSEL OPERATING OUTSIDE THE EEZ

During the reporting period, 41 Namibian licensed vessels were operating in the Economic Exclusive Zone (EEZ) as indicated in the table below.

Table 11: Namibian Vessel that were operational outside the Namibia EEZ, during the reporting period.

EEZ	Description	#Vessels
Angola	2 Purse Seiners and 3 Hake Wet Trawlers – (in terms of an MoU – the VMS data are sent to Angolan Authority daily)	5
ICATT	Tuna Vessels	29
Kenya	Tuna Longline	1
Mauritania	Midwater Trawler (Horse Mackerel)	1
Mozambique	Monk and Sole (Vessel sold and is still operating there)	1
Las Palmas	Midwater Trawler (Horse Mackerel)	1
RSA	2 Hake Wet Trawlers and one Hake Long Liner	3
Total		**41**

FISHING CONDITIONS VIOLATIONS

During the period under review fifteen (15) fishing vessels trigger the VMS for crossing the 200m and 300m depth zones respectively, with speeds that could be categorised as trawling (fishing). All triggers evoke an investigation by the Fisheries Inspectors for non-compliance with conditions. The investigation revealed that some triggers were indeed violations of the legislation, of which seven (7) of those were so severe that they the involvement of the judiciary was warranted. All seven (7) cases involved Captains of Midwater Trawlers that violated conditions pertaining to the 200m depth restrictions. At the end of the reporting period, four (4) cases were finalised and three (3) were postponed for plea and trial. The details of those cases are provided in the table below.

Table12:Details of Fishing Vessels tracking related Court Cases, during the reporting period.

Vessel	Accused Person	Violation	Results
1. FV Heinaste	Captain	3 charges under Section 52 (4) (a) of MRA	Fined N$950,000.00
2. FV Venus 1	Captain	2 charges under Section 52 (4) (a) and Section 53	Fined N$330,000.00
3. FV Carapau 1	Captain	2 charges under Section 52 (4) (a) and Section 53	Fined N$700,000.00
4. FV Jupiter 1	Captain Chief Mate	3 charges under Section 52 (4) (a), Regulations 24 (4) and Section 53 1 charge of Regulation 24 (4)	Fined N$750,000.00 Fined N$300,000.00
5. FV Zephyr	Captain	2 charges (i) Section 52 (4) (a) and (ii) Section 52 (4) (c).	Bail of N$50,000.00 and case postponed to ensuing period
6. FV Krossfjord	Captain	(i) Section 52 (4) (a) and (ii) Section 52 (4) (c)	Bail of N$70,000.00 Case postponed to ensuing period
7. FV Mediva Star	Captain	(i) Section 52 (4) (a) (ii) Section 52 (4) (c) (iii) Section 51 (1) (a) r/w Section 52 (4) (a) of MRA	Bail of N$50,000.00 and case postponed to ensuing period

VMS SUPPORT AND MAINTENANCE

During the period under review, the FMC support and maintenance continued to be rendered by CLS, a French based company, which has contract agreement with the Ministry. CLS render maintenance support to the FMC to facilitate the smooth functioning of the system and to render technical assistance to ensure that the VMS functionalities are in line with the Regulations. No hiccups were experienced during the reporting period.

OPERATION CENTRE

As part of Fisheries Monitoring, the Ministry has an Operations Centre hosting communications facilities to enable daily communication by patrol and research crafts as well as Fisheries Inspectors during their routine coastal patrols, and Fisheries Observers on board vessels and FMC to facilitate speedy action should the need be.

During reporting period, the Operations Centre was manned on a normal working shift basis. However, during the patrol mission it was manned on a 24 hours shift basis. No problems were experienced.

ONSHORE MONITORING AND CONTROL

The Directorate of Operations is also tasked with the monitoring and inspection of fishing landing activities in harbours, onshore processing plants and at the mid-water.

During the reporting period the regional offices conducted daily monitoring missions, inspected, and monitored the landings of fishery products by 2,518 Namibian fishing vessels' trips. The Walvis Bay office further monitored the landings and other activities of bunkers, repairs, crew changes and provisions of 119 foreign fishing vessels. During these activities, the Fisheries Inspectors detected violations and issued two hundred and seven (207) fines, amounting to N$62,100.00 as indicted in the table below. All violations were

Table 13:Violations detected during factories inspections, for the reporting period.

Violations Type	Fines issued	Amount N$
Harvesting undersize Rock Lobsters	169	50,700.00
Harvesting Rock Lobster in berry	38	11,400.00
Total	**207**	**62,100.00**

MARINE RECREATIONAL FISHING PERMITS REVENUE

As part of its mandate, the Directorate of Operations, during the reporting period collected N$298,244 in revenue for recreational permits issued. The details of the permits issued are tabulated below.

Table 14: Recreational Fishing Permit revenue collected during reporting period

Office	# of Month Permit		# of 3-Month Permit		# of Annual Permit		Total Permits	Amount (N$)
	Namibian	Foreign	Namibian	Foreign	Namibian	Foreign		
Walvis Bay	7,370	251	402	1	738	0	8,762	247,604.
Lüderitz	1,983	250	118	17	67	14	2,449	50,540.
Total	**9,353**	**501**	**520**	**18**	**805**	**14**	**11,211**	**298,244**

Inland Monitoring, Control and Surveillance

INLAND MONITORING, CONTROL AND SURVEILLANCE (INLAND MCS)

The Directorate of Operations is also responsible to monitor and enforce compliance to the Inland Fisheries Act and Regulations, which legislate fishing activities in rivers and inland water bodies. To this end the Lüderitz Office, is responsible to conduct MCS activities at rivers or inland water bodies in the Karas and Hardap Region, Walvis Bay monitors inland water bodies of Erongo and Khomas. Whereas Ongwediva is responsible for the Kunene river and inland water bodies in the far north regions. Rundu is responsible for the two Kavango regions and Katima for the Zambezi region.

INLAND MCS PATROL MISSIONS

During the reporting period, the regional offices conducted one thousand and sixty three (1,063) inland MCS mission of which 1,029 were land based and 34 on the rivers, covering a distance of 213,268 kilometres.

Financial constraints hampered operations, heavily as vehicles and boats required maintenance and were thus not available for operations. For example the Lüderitz Office conducted only seven (7) Inland MCS missions covering south of Oranjemund via Naute Dam, Aussenkehr settlement, Noordoewer border post, Hardap and Karasburg due to lack of resources, while the Walvis Bay Office could only manage 3 missions to the Swakoppoort Dam. The table below provide the Inland MCS missions per regional office and the distances covered for the period under review.

Table15:Number of Inland MCS Patrol Missions undertaken during the period under review

Patrol Missing Type	Total Number of Patrol Missions					
	Lüderitz	Walvis Bay	Ongwediva	Rundu	Katima Mulilo	Total
Land patrol missions	7	3	352	361	306	1,029
River patrol missions	N/A	N/A	5	14	15	34
Total	**7**	**3**	**357**	**375**	**321**	**1,063**

Table16:Total Distance travelled during Inland MCS Patrol Missions for the period under review

Patrol Missing Type	Total Number of Patrol Missions					
	Lüderitz	Walvis Bay	Ongwediva	Rundu	Katima Mulilo	Total
Land patrol missions	0	0	73,883	73,309	65,524	212,716
River patrol missions	N/A	N/A	115	382	55	552
Total	**0**	**0**	**73,998**	**73,691**	**65,579**	**213,268**

For Katima Mulilo, one of the river patrols was conducted jointly with counter parts from Botswana and the rest were with the assistance from Kasika Conservancy, Gondwana, and Mutoya Lodges and the rest were conducted with NDF, Nampol and MET officials during Kalahari operations. For Rundu, all river patrols were made possible with the assistance of the NAMPOL Water Wing's and the Customs Patrol Boats.

The Inland MCS team further conducted sixteen (16) roadblocks, mainly in the Zambezi region.

The table below prove a summary of the running cost that were associated with the above activities.

Table 17: Inland MCS Fleet Running Cost, for the period under review (for the Lüderitz and Walvis Bay Offices the information are included under the Marine section running cost).

Patrol Craft Type	Distance Travelled (km)	Service/Repairs Cost(N$)	Fuel Consumed (litres)	Fuel Cost (N$)
Vehicles	213,268	203,618.31	22,968.42	325,295.36
Boats	552	0	272.27	4,666.12
Total	213,820	203,618.31	23,240.69	329,961.48

During the period under review, the Inland MCS team observed number of none adherence to the Inland Fisheries legislation by the member for the communities, involving both Namibian and Non-Namibian Nationals. Illegal activities, observed on the rivers are of particular concern, most observed were on the side of the river (in Angola or Zambia depending on the river) however, culprits also tend to the other side when law enforcement approaches, and can do nothing and the officers can do nothing.

During the abovementioned Inland MCS mission, a total 171 fines were issued, amounting to N$78,950, of which 108 fines were paid, amounting to N$46,650, by the end of the reporting period.

Table18:Number of Fines Issued during the period under review

Violation Type	Number of Fines Issues						Amount (NS)
	Lüderitz	Walvis Bay	Ongwediva	Rundu	Katima Mulilo	Total Fines	
Fishing With Unlicensed Net	15	0	0	0	1	16	**4,800**
Fishing Without Recreational Fishing Permit/Failure To Produce A Fishing Permit	10	0	0	0	38	48	**14,400**
Fishing With Monofilament Gill Net	0	0	0	0	21	21	**16,800**
Fishing During Closed Season	0	0	0	0	5	5	**4,000**
Found In Possession Of Fresh Fish During Closed Season	0	0	0	0	15	15	**11,500**
Bashing	0	0	0	0	3	3	**1,350**
Fishing In A Prohibited Area	0	0	0	0	2	2	**600**
Failure to register a fishing net	0	0	0	11	1	12	**3,600**
Use Of Small Sized Gill Nets	0	0	0	0	1	1	**300**
Unauthorised Drag Net Fishing	0	0	1	22	20	43	**19,300**
Failure to renew a certificate of registration	0	0	0	1	0	1	**800**
Providing False Information	0	0	0	1	0	1	**900**
Use of expired certificate of registration.	0	0	0	2	0	2	**600**
Total	**25**	**0**	**1**	**37**	**107**	**170**	**78,950**

A number of items were also confiscated during the Inland MCS Missions as tabulated in the table below.

Table19:Items confiscated during MCS Missions during the period under review

Item Type	Action Taken	Number of Items Confiscated					
		Lüderitz	Walvis Bay	Ongwediva	Rundu	Katima Mulilo	Total
168kg Dry Fish	Donated	0	0	0	0	1	1
209kg Tilapia	At Kahenge Police Station	0	0	0	1	0	1

Item Type	Action Taken	Number of Items Confiscated					
		Lüderitz	Walvis Bay	Ongwediva	Rundu	Katima Mulilo	Total
Bows	Stored at Office	0	0	0	5	0	5
Bucket fresh fish	Disposed by Fire	0	0	0	0	1	1
Cat Fish	Stored at Office	0	0	0	1	0	1
Cooler box of fish	Stored at Office	0	0	0	0	4	4
Drag Nets monofilament	Disposed by Fire	0	0	0	0	15	15
Dugout Canoe	Disposed by Fire	0	0	0	1	3	4
Dry fish bags	Donated to Needy	0	0	0	0	15	15
Monofilament gill net	At office/ Disposed by Fire	0	0	148	190	974	1,312
Mosquito Nets	Disposed by Fire	0	0	23	136	14	173
Multifilament gill net	Disposed by Fire	0	0	0	8	2	10
Paddle Stick	Stored at Office	0	0	0	1	0	1
Rows	Stored at Office	0	0	0	16	0	16
Shade Nets	Disposed by Fire	0	0	1	23	0	24
Spears	Stored at Office	0	0	0	4	0	4
Tent Top	Disposed by Fire	0	0	0	0	1	1
Tilapia	Stored at Office	0	0	0	131	0	131
Tiger Fish	Stored at Office	0	0	0	1	0	1
Throw Nets	Stored at Office	0	0	0	2	0	2
Three Spot Tilapia	Donated	0	0	0	0	0	0
Total		**0**	**0**	**172**	**520**	**1,030**	**1,722**

During the reporting period, the team also opened five criminal dockets leading to the arrests of ten (10) foreign nationals for illegal fishing activities with the Namibian borders. The table below provide further details.

Table 20:The following Case Docket were opened during the period under review.

Offense/Charge	Court District	Accused	Court Result
Section 11(3), Fail to avail fishing licence for inspection to a Fisheries Inspector when required to do so. Section 22(3), in possession of prohibited monofilament gill nets, Regulation 17(2) (b) using a net in a manner that obstructs more than one half of the width of the watercourse where fishing is carried out, and Regulation 15(a), bashing as a fishing method.	Katima Mulilo	2 Zambian Males	Fined N$3,400.00 each or 9 months imprisonment. One paid fine. The other is serving his prison term in Grootfontein.
Section 22(3), for using a prohibited monofilament gill net, Regulation 16, drag netting and, Section 11(3), fishing without a licence	Katima Mulilo	Zambian male	Suspect released after Police failed to charge him within 48 hours as prescribed in the Criminal Procedure Act.
Section 22(1), use of prohibited monofilament gill net, Regulation 15(b), For bashing as a fishing method to catch fish, Section 11(3), fishing without being without a holder, and Section 22(2), fishing in a reserve without a written permission of the Minister.	Katima Mulilo	2 Zambian males	Accused were released with a warning
Section 11(3), fishing without a licence, Section 22(1), fishing during closed season and Section 22(3), use of monofilament gill net.	Katima Mulilo	2 Zambian males	Fined N$800.00 each or two months imprisonment.
Section 22(1), fishing during closed fishing season, and Regulation 18, use a net with small mesh sizes and Section 22(3)(a), using of prohibited monofilament gill net in Inland waters.	Katima Mulilo	3 Zambian	Fined N$500.00 each or one month imprisonment was given. Fines paid

JOINT OPERATIONS

During the period under review 15 joint patrol were conducted with various law enforcement agencies within the country, comprising NDF, Nampol and MET officials. The frequency was however lower, during the reporting period, due to financial constraints.

In addition, the Fisheries Inspectors, as per the Namibia-Botswana Joint Permanent Commission on Security and Defence, which calls for joint operations by the two Authorities responsible for fisheries matters, conducted only one joint patrol covering inland water bodies in both countries, including the Chobe River.

Due to financial constraints, during the period under review, the Inland MCS team joined only one of the NAMBOT (Namibia and Botswana) Security Cluster (law enforcement officials from customs, defence, environment, fisheries, and immigration from the two countries) joint operations, which are conducted on a quarterly basis. The NAMBOT operations includes raising community awareness on various security issues of concern including illegal fishing, poaching, etc.

A planned joint patrol mission between Fisheries authorities from Namibia and Zambia could not materialise due to security clearance for Zambia Fisheries Department officials by the Zambian Police.

4THE ECONOMICS PERFORMANCE OF THE FISHING SECTOR

The fishing sector is significant to the Namibian economy in terms of providing socio economic benefits. This sector is important for employment creation, value addition to fish and fishery products, investment opportunities, export earnings opportunities, and food security. The operation of fishing sector sustain or support other sectors of the economy such as repair and maintenance, stevedoring services, and fishing inputs suppliers respectively.

Preliminary data for 2019 indicate that the sub-sector contribution to GDP increased with 4.5% as compared to 2018. The growth of the sector contribution to GDP is attributed to growth in landing particularly from hake long line, large pelagic long-line and from crustacean's species.

TOTAL ALLOWABLE CATCHES

Total Allowable Catch (TAC) is a catch limit set per fishery, for a fishing season that is expressed in metric tons or numbers. It is determined annually based a comprehensive scientific assessment of the state of the stocks and economic performances of the sub-sectors. The Marine Resources Advisory Council provides recommendations on the level of TAC to the Minister responsible for Fisheries and Marine Resources, who is mandated to

determine the total allowable catch (TAC) as per the Marine Resource Act, No. 27 of 2000, section 38 (1) & (2).

The fisheries sub-sectors have different fishing seasons depending on its operations, biological features and interaction in the ecosystem. The fishing season for, horse mackerel pilchard and crab, commence on 1st January to 31st December. Whilst that of hake starts from the 1st November to 30th September. The month of October is a closure month for the hake fishery, in order to allow fish spawning. The fishing season for rock lobster starts on 1st November to 30th April, monk starts from 1st May to 30th April and the season for large pelagic runs from 1st September to 31st August. Seals is not harvested in metric ton but is harvested in number of permissible pups and bulls. The fishing season for seals is the shortest, which starts on 1st July to 15th November.

The large pelagic fishery, the TAC is set by the International Commission for the Conservation of Atlantic Tuna (ICCAT). This is an intergovernmental organization responsible for the management and conservation of tuna and tuna-like species in the Atlantic Ocean and adjacent seas. The linefish fishery consists of snoek, kob, west coast steenbras and galjoen. The fishery is effort controlled with limited number of vessels targeting these species, net restrictions and no mechanical hand lining or any other method of fishing is allowed. As for Orange roughy no TAC has been set since 2008 as the fishery has been placed on moratorium. Guano is natural manure composed mainly of the excrement of sea birds, found especially on islands, however, seabird guano harvested in Namibia are on artificial platforms. The harvesting is done in three to five years intervals.

Table 1 below depicts the set TACs per fishery for the past five years. The TAC for hake and seals remained the same for the past four years, whilst for rock lobster and monk TAC's have decreased during the 2019/20 fishing season. The crab and horse mackerel fisheries TAC's increased during 2019/20 fishing season. As for pilchard, no TAC has been set since 2017/18 fishing season, as the fishery has been placed on moratorium for a period of 3 years, for the recovery of the stock.

Table 21: Total Allowable Catches, 2015/16-2019/2020

Fishery		Years				
		2015/16	2016/17	2017/18	2018/19	2019/20
Hake		140,000	154,000	154,000	154,000	154,000
Horse Mackerel		350,000	340,000	340,000	340,000	349,000
Pilchard		25,000	10,000	-	-	-
Monk		10,000	10,000	9,600	8,000	7200
Red Crab		3,446	3,446	3,446	3,446	3900
Rock Lobster		250	268	230	200	180
Large Pelagic	Albacore	3,600	3,600	3,600	3,600	3,600
	Swordfish	1,168	1,168	1,168	1,168	1,168
	Big eyes Tuna	2,100	2,100	2,100	2,100	2,100
Seals (in Numbers)	Pups	80,000	60,000	60,000	60,000	60,000
	Bulls	6,000	8,000	8,000	8,000	8,000

Source: MFMR, 2020

FISHERIES VALUES

Fisheries values are monetary value of fish caught in the Namibian water. This values consist of landed value, final value and export value. These values are obtained by multiplying the value by volumes. Detailed information on fisheries values is on the subsequent section.

4.7.1 Landed Value

Landings value is the total value of fish, in its immediate form as landed, before any transformation. Fish volume are either landed unprocessed or processed on board, a summation of fish landed unprocessed and fish processed on board multiplied with their respective prices determine the landed value. In 2019, the sector landed 485,927 MT made up 81,882 MT of um processed fish and 404,044 MT processed on board. Thus, taking into account landings and respective prices, the 2019 landed value is N$10,898 billion. The 2019 landed value decreased with 13% as compared to 2018. The decrease in landed value is attributed to the volume of landings that decreased from 530,707 MT to 485,927 MT for 2018 and 2019 respectively.

4.7.2 Final Value

Final value is the value of processed fish, the value of fish and fishery products that are sold to consumers. This value is made up of fish processed on board vessels and fish processed in onshore processing plants. The final value of 2019 is N$11,668 billion, while the final value for 2018 was N$12,977 billion. As for the case of landed value, the final value for 2019 decreased with 10%. The decrease of final value resulted from the volume of landings, which in turn was processed into final products.

4.7.3 Export value

Export value is the value of fish and fishery products that leave the country as commodities. Fish and fishery products where among Namibia's top five leading export commodities in 2019, making it the country's number one food item export revenue earner besides minerals and vessels.

As per table below. Namibia's export of fish increased with 2.9% from N$9,613 billion in 2018 to N$10,034 billion in 2019. An increase in export is attributed to four main importers of Namibian fish and fish products who increased their volume of imports. Spain is the main importer of Namibian fish, the value of fish imported in 2019 increased with 10.33% from N$3,560 billion in 2018 to N$3,928 billion in 2019. The second importer that led to an increase in Namibia fish export value is South Africa, their imports increased with 4.2% from N$1,494 billion in 2018 to N$1,558 billion in 2019. Democratic Republic of Congo is the third major importer of Namibian fish, their import from Namibia increased with 19.6% in 2019 from N$970 million to in 2018 to N$1,161 billion in 2019. The fourth main exporter that led to an increase of Namibia fish export value is Zambia. Their import value from Namibia increased with 7.7% from N$1,068 billion to N$1,119 billion.
Table 2 below shows Landings value, final value and export value for the past five years.

Table 22: Landings, final and export value from 2015 to 2019

	2015	2016	2017	2018	2019
Landed Value (N$) mill	10,304	16,449	22,120	12,561	10,898
Final Value (N$) mill	11,934	17,574	24,516	12,977	11,668
Export Value (N$) mill	7,780	8,838	8,960	9,745	10,034
% of total export of goods	13.5	13.9	14.1	10.4	10.9

Source: MFMR and NSA, 2020

4.8 VALUE ADDITTION

Value addition in the fishing sector is observed through increased final value of fish landed, by means of creating new value added products or increased proportions/extend of value added products. Value addition has not only been prioritised by the Ministry, but also at the national level through National Development Plans.

Over the years, MFMR as a governing institution has implemented proactive management measures to encourage innovations and product development. For instance, the implementation of a 70: 30 policy in the hake fishery has increased land-based processing to 70%. This policy remain beneficial as it discourages export of raw materials and simultaneously, creates employment in the sector. Further, a recent management condition was developed to promote onshore value addition initiatives in the horse mackerel fishery, in response to a National Development Programme Goal (NDP5) to reach a target of 70% of value addition in the horse mackerel fishery by 2021/22. Although value addition conditions are explicitly defined have only been implemented in the hake and horse mackerel fishery, other fisheries are also encouraged to invest in value addition. Figure 1 below shows the products per fishery as a result of value addition.

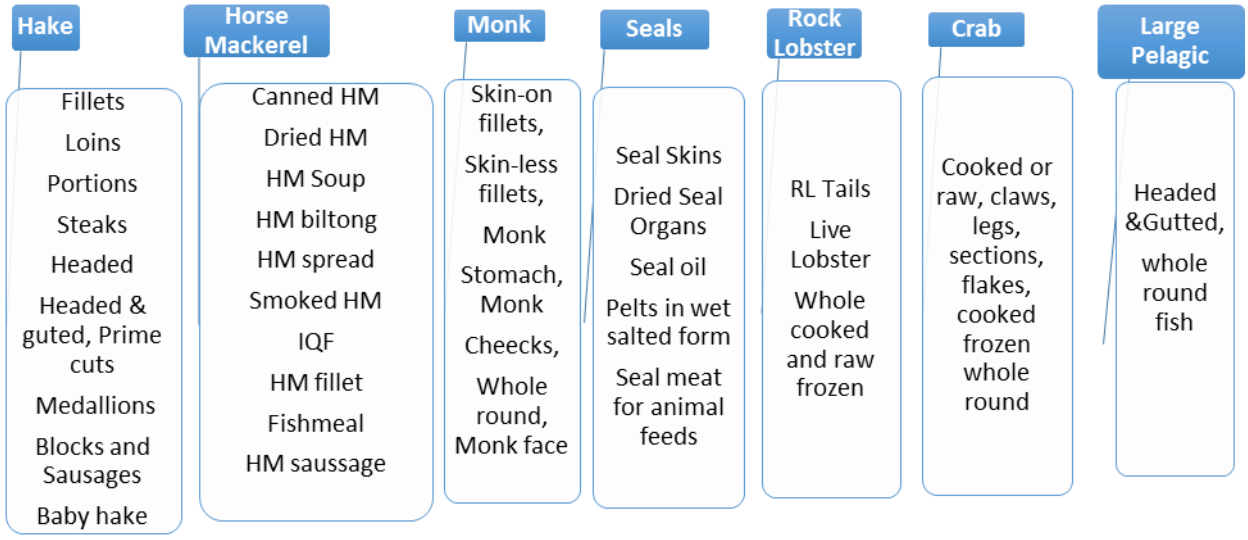


Figure 9: Value added products per fishery

Source: MFMR, 2019

MARKETING

The Namibian fishing industry continues to secure and increase its market shares in most of its lucrative markets, taking advantage of the productive upwelling Benguella Current System. Namibian fish and fish products are generally competitive in the international market because of their quality and sustainably managed. This means Namibia fisheries sector has the potential to penetrate high valued markets such as USA and UK through recognised certifications such as MSCs.
Europe remains the main market for Namibian fish and fish products, mainly hake, monk and deep sea red crab. South Africa and Japan are amongst the traditional markets for Namibian fish and fish products. South Africa is known for its high demand of hake, horse mackerel & deep sea red crab products whilst Japan demands crustaceans.

Namibia is observed to have increased its fish market share of all fishery products during 2018/19 and 2019/20 as observed in table 1 below. However, it is important to highlight that 100% of seal products that is sold in the local market is due to lack of international markets, nevertheless, it is noted that such products are mainly bought by foreign nationals living in Namibia, who then, export to their respective countries (China, Japan and Hong Kong) for own consumption. The table below shows Namibia's market share in different markets per sub-sector during the period 2018/19 and 2019/20.

Table 23: Market shares 2018/19 and 2019/20

Sub-sector	Markets	Volumes sold (%)	
		2018/19	2019/20
Hake	Spain	44%	49%
	Namibia	28%	18%
	South Africa	17%	23%

	France	3%	2%
	Italy	3%	3%
	Germany	2%	2%
	Netherlands	1%	1%
	Australia	1%	1%
	Others	2%	1%
Monk	Spain	56%	43%
	Portugal	8%	18%
	Italy	33%	38%
	Holland	2%	1%
	Namibia	1%	0%
Horse Mackerel	DRC	27%	22%
	South Africa	23%	16%
	Namibia	23%	34%
	Zambia	10%	15%
	Mozambique	3%	10%
	Others		
Crab	Spain	65%	65%
	South Africa	27%	26%
	Japan	7%	6%
	Namibia	1%	3%
Rock Lobster	Japan	77%	69%
	Namibia	20%	4%
	Hong Kong	3%	4%
	China	0	23%
	US	0	-1%
Seals	Namibia	100%	100%

Source: MFMR, 2017/18

4.9.2 Landed Value per Species

In accordance to Article 44 of the Marine Resources Act number 27 of 2000, the Ministry is mandated to determine the landed value of various fish species. Landed value is the value of fish in the form which it is landed. The value is determined by considering the total cost evolved during harvesting at sea before any transformation takes place onshore; it is influenced by the quality of the fish catches and the size.

During 2019/20, the landed value and the form in which the fish is landed were as indicated in table 4 below.

Table 24: Landed values, 2019/20

Targeted Fishery Species	Form landed	Landed value (N$/kg)
Rock Lobster	Whole	193.6
Shark Fin	Whole	73.17
Crab	Whole	52.4
Monk	Headed & Gutted	51.2
Sword fish	Whole	49
Galjoen	Whole	45
Kingklip	Headed & Gutted	42.38
Steenbras	Whole	30
Kob	Whole	30
Blacktail	Whole	30
Hake	Headed & Gutted	25
Oil Fish	Whole	24
Blue Marlin	Whole	24
Sail Fish	Whole	24
Dorado Fish	Whole	24
Sole	Gutted	23
Albacore	Whole	22
Big eye Tuna	Whole	22
All Sharks	Whole	22
Snoek Frozen	Whole	21.8
Yellow Fin	Whole	20
Squid	Whole	10
Horse Mackerel	Whole	9.5
Alfonsino	Whole	7
Ribbon Fish	Whole	7
Jacopever	Whole	7
Angela Fish	Whole	6
Panga Reds	Whole	5
Dentex	Whole	5
Moon Fish	Whole	5
Guano	Whole	5
Pilchard	Whole	4.4
Seal	Whole	4
Gurnard	Whole	3
John Dory	Whole	3
Barber	Whole	3
Mullets	Whole	2
Spring Harders	Whole	2
Anchovy	Whole	1.5
Sardine	Whole	1.5
Red eye	Whole	1.5

Lantern	Whole	1.5
Gobies	Whole	1.5
Mackerel	Whole	1.5

Source: MFMR, 2019

4.9.3 International Fish Prices

The international prices for Namibian fish and fish products are influenced by market forces of demand and supply. In addition, the demand of Namibian fish products is positively encouraged by its rich nutrition and taste. The Namibian waters and deposits are considered clean and rich due to the Benguella current. Consequently, the size and quantity of the product plays an important role in the price determination of the product up for purchase. On the other hand, the Namibian's fish volumes in the international market is relatively insignificant and thus, Namibia is generally a price taker.

The fishing industry generally performed well in terms of market prices in 2019/20 as compared to 2018/19, particularly with hake, horse mackerel, large pelagic, rock lobster and seal products. Good prices recorded during 2019/20 are mainly attributed to high demand and inflation rate. Whilst the average prices of other fisheries produces such as monk have relatively reduced in 2019/20. Table 2 below shows the market prices of the Namibian fish and fish products in 2019/20.

Table 25: Products and prices per sub-sector for the year 2019/20

Sub-sector	Products	Prices (N$)	
		2018/19	2019/20
Seals	Seal Oil	N$ 14/litre	N$ 18.4/litre
	Seal Skins	N$ 51/skin	N$ 42/skin
	Seal Genitals	N$ 18,000/kg	N$ 25,201/kg
	Seal capsules	N$ 100/bottle	N$ 100/bottle
	Seal meal	N$ 150/kg	N$ 150/kg
Crab	Frozen whole round	N$ 55.45/kg	54.84/kg
	Crab sections	N$ 94.47 /kg	N$ 106.82/kg
Monk	Monk Stomachs	N$ 61.85/kg	N$ 51.74/kg
	Monk cheeks	N$ 13.57/kg	N$ 12.75/kg
	Skin on monk tails	N$ 133.04/kg	N$ 131.17//kg
	Skin less monk fillets	N$ 135.04/kg	N$ 132.71/kg
	Skin less monk tail	N$ 125. 73/kg	N$ 146.09/kg
	Skin on monk Fillet	N$132.37/kg	N$ 129.32/kg
	Monk Whole Round	N$ 52.18//kg	N$ 48.69/kg
	Monk face	N$ 69.56/kg	N$ 71.69/kg

Rock Lobster	Whole cooked	N$ 251.58/kg	N$ 311.84/kg
	Whole raw lobster	N$ 301.20/kg	N$ 324.02/kg
	Raw Tails	N$ 170.80/kg	-
	Live Lobster	N$ 415.90/kg	N$ 352.29/kg
Hake	Headed & Gutted	N$ 30.80/kg	N$ 28.62/kg
	Frozen Hake fillets skinless	N$ 51.88/kg	N$ 66.93/kg
	Frozen Hake fillets Skin on	N$ 53.70/kg	N$ 58.83/kg
	Portions	N$ 60.73/kg	N$ 63.92/kg
	Loins	N$ 79.72/kg	N$ 72.52/kg
	Hake PQ	N$ 48.90/kg	N$ 48.90/kg
Horse Mackerel	Overland Frozen whole	N$ 10.50/ kg	N$ 11.59/kg
	Transhipment Frozen whole	N$ 9.48/ kg	N$ 10.33/kg
	Fish Meal	N$22.33/kg	N$ 15.22/kg
Tuna	Polling whole round Tuna	N$ 53.97/kg	N$ 46.09/Kg
	Longline whole round (For Sashimi)	N$ 46.47/kg	N$ 56.60/kg
Swordfish	Whole round (WR)	N$ 39.32/ kg	N$ 40.32/ kg

Source: MFMR, 2019

CONTRIBUTION TO GROSS DOMESTIC PRODUCT

Fishing sector is an important sector to the Namibian economy in terms of its contribution to Gross Domestic Products (GDP), which is the total value of fish and fishery products produced in a specific year. Primarily data for 2019 indicates that this sector contribution to GDP increased with 4.9% from 2018 to 2019. This sector contributed N$6,367 billion in 2019 while in 2018 the sector contributed N$6,074 billion. The increase in GDP is attributed to positive growth experienced in terms of landings in demersal sector, particularly from Hake long-line, and monk and sole sub-sector respectively. In addition, the GDP positive outlook resulted from an increase in landings of large pelagic long line and crustaceans.

Table 6 below indicates the breakdown of the fishing sector contribution to GDP for the past five years (2015 - 2019) in million dollar at current prices.

Table 26: Fisheries contribution to GDP, 2015 – 2019

	2015	2016	2017	2018	2019
Fishing and Fish processing on board (N$ mill)	3 888	4 539	4 472	4,521	4,970
Processing onshore (N$ mill)	1 056	1 651	1 806	1 553	1,397
Total fish contribution to GDP (N$ mill)	4 945	6 190	6 278	6 074	6,367
% of total fish contribution to GDP	3.3%	3.7%	3.6%	3.2%	3.6%

Source: NSA, 2020

As indicated on table 6 above, Fishing and fish processing on board refers to fish processed in the fishing vessels, also referred as factory vessels. These vessels are designed with processing factories on board where fish is processed in the vessel, while at sea. On the other, the sub-sector have land based fishing operations that are supplied with fish by wet trawler or wet long liner vessels. Namibia has made strides in terms of onshore processing factories, where by the fishing sector have in total 25 operational onshore processing plants (Hake 15, Rock Lobster 1, Crab 1, Pilchard 1, Horse Mackerel 2, Linefish 2, Squit 1 and seals 2). The

sector continue to make strides in terms of developing onshore processing plants. The onshore processing plants plays a role of enhancing the sector contribution to GDP in terms of value addition.

The development and sustenance of operations of onshore processing plants is in line with NDP5 implementation plan that seek Namibia to be a key processing hub. As a results of NDP5 implementations plan, the sector continued to invest in onshore processing factories particularly the horse mackerel sub-sector.

ECONOMIC INDICATORS

6.1Fuel Prices

Fuel prices are considered as one of the primary cost for the fishing industry. Fuel is used as the primary means to keep operations in the industry going by fuelling the vessels needed (Trawler vessels) to catch allocated quota. The implication of a reduction in fuel prices results in maximization of production, and hence an increase in goods produced for export. Therefore, increasing government revenue collected. This will depend also on the exchange rate as discussed at the end of the paper.

The table below provides information on coastal fuel prices from January 2019 to June 2020. Note that fuel prices for November 2019, December 2019 and April 2020 are not available yet. Efforts to obtain the data was unsuccessful, however, with time it will be complete.

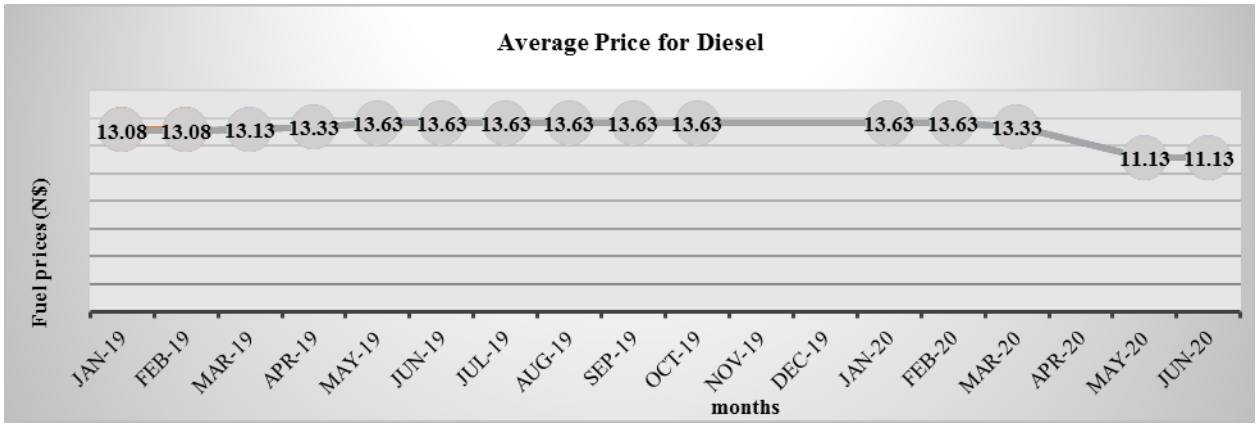


Figure 10. Average fuel prices for diesel (Ministry of Mines and Energy 2019-2020)

The prices remained stable for majority of 2019 and started to depreciate by 2020. The diagram shows that prices rose from N$13.08 to N$11.13 which may indicate that fuel prices have decreased. However, for majority of 2019 prices increased to N$13.63 and remained at

this level for majority of 2019. Implying that fuel prices have increased, making it more costly to process fish on board and operate the vessels.

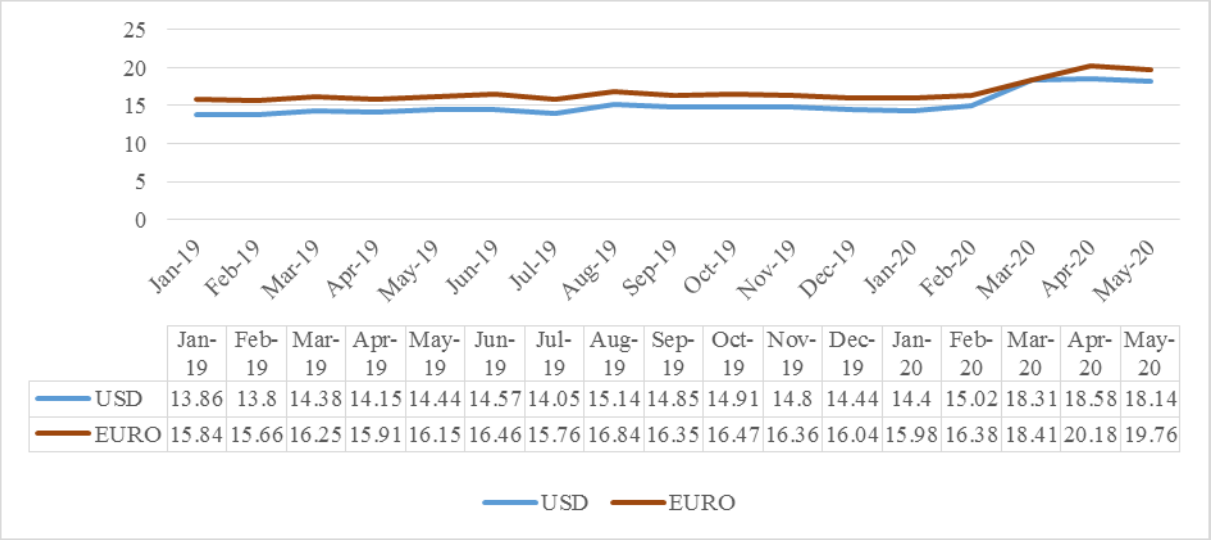
In addition, an increase in fuel prices increased fixed costs such as depreciation and salaries. Another cost to consider is the transport cost of allocating fuel from Walvis Bay to operations in Luderitz which increased.

By the year 2020, fuel prices decreased by 18% which resulted in an increase in revenue for the fishing industry. According to Namibia Statistics Agency (NSA), the fishing industry registered positive growth of 3.1% for the first quarter regardless of economic contractions. This was due to an increase in real value added as compared to the same period in 2019 which was recorded at 2.7%.

Hence, production costs decreased (overall expenses), the number of days a vessels was at sea increased, production capacity increased, which led to an increase in the stock of fish exported. This led to an increase in total revenue generated in the fishing sector as Namibian fish was competitive internationally.

6.2 Exchange Rate Volatility

An exchange rate is the rate at which one currency is exchanged for another currency. Hence, this allows countries to trade and earn or pay for a good or service purchased. The main currencies earned by the fishing industry are the American Dollar, Euro and South African Rand.
The Namibian dollar is advantageously pegged 1:1 with the Rand which has greater ability to withstand currency volatility internationally. The Namibian Dollar has experienced volatility from the Euro and American Dollar. Hence, the diagram below observes the changes to the Namibian Dollar against the Euro and American Dollar from 2019 to 2020.



	Jan-19	Feb-19	Mar-19	Apr-19	May-19	Jun-19	Jul-19	Aug-19	Sep-19	Oct-19	Nov-19	Dec-19	Jan-20	Feb-20	Mar-20	Apr-20	May-20
USD	13.86	13.8	14.38	14.15	14.44	14.57	14.05	15.14	14.85	14.91	14.8	14.44	14.4	15.02	18.31	18.58	18.14
EURO	15.84	15.66	16.25	15.91	16.15	16.46	15.76	16.84	16.35	16.47	16.36	16.04	15.98	16.38	18.41	20.18	19.76

Figure 11. EURO and USD exchange rate

Overall, from the period 2019-2020 the Namibian Dollar appreciated against both the USD and Euro. This implies the fishing industry would sell fish internationally at a higher price as compared to their competitors. The Namibian Dollar appreciates from N$13.86 to N$18.14 (24% increase) against the US Dollar and appreciated from N$15.84 to N$19.76 (20%

increase) against the Euro. Hence, less revenue would be gathered from exports which decrease the profitability of the fishing industry.

In terms of local fish sales, prices for fish remained stable as distributors of fish such as Namibia Fish Consumption Trust (NFCPT) sold fish to majority of regions (13). Hence, ensuring that Namibia continues to cultivate a culture of consuming fish.

7. INLAND FISHERIES AND AQUACULTURE SUB-SECTORS

The Ministry of Fisheries and Marine Resources continues to promote biodiversity protection of inland water systems and responsible sustainable inland freshwater capture fisheries and aquaculture to enhance food and nutritional security, reduce poverty, generate employment, improve rural livelihoods and increase investment. Fish, fishing and fisheries are an integral part of the culture and economy of many people in Namibia. The inland fisheries resource is under severe pressure from individuals who exploit the resource for financial benefit at the detriment of local communities that depend on fish for their survival. Aquaculture in Namibia consists of freshwater fish farming and marine fish farming (mariculture).

7.1 **INLAND FISHERIES**

The subsistence fishery from rivers, lakes and oshanas in the Zambezi, Kavango (East and West), Oshana, Ohangwena, Oshikoto, Omusati, Otjozondjupa and Kunene regions play an important role in the daily lives of rural communities. The fishing season in the Omusati, Ohangwena, Oshikoto and Oshana regions are only seasonal when the oshanas in the Kunene/Cuvelai system are flooded during the rainy season. The severe draught of 2019/20 did not allow for the usual flooding (efundja) during the rainy season and as a result almost no subsistence fishing took place from oshanas.

The fishery in the Zambezi and Kavango regions are done throughout the year with about 33% of the communities along the Zambezi and Chobe completely dependent on fishing for their livelihood. The fishing in the Kavango and Zambezi River systems do intensify during the low water periods in these regions when fish are concentrated. Illegal drag netting (Fig 1) with monofilament nets and use of banned monofilament nets continue in these systems and also increased in the protected Kwando River system and the Mahangu Park on the Kavango River.



Figure 11: Illegal drag netting and use of monofilament nets in Zambezi and Kavango systems continued during 2019/20

Lake Liambezi received no water and were practically dried up. Overfishing in the Zambezi-Chobe system resulted in the reduction of catch per unit effort of 9.1kg per net set during 2010 to 3.8kg per net set at the end of 2017, with a resulting decline in total estimated fish landings from 6100 ton during 2010 to 2534 ton at the end of 2017 representing a 58% loss of fish stocks over the period. This trend continue as witnessed during the annual biological surveys of this system during 2019/20.

The estimated harvest from the inland fisheries resource (rivers, lakes, dams) for 2019/20 in the Northern Regions of Namibia is around (estimate) 1500 tonnes for the Zambezi-Chobe system and 600 (estimate) tonnes for Kavango and Kunene systems with a total (estimate) inland fisheries landing of 2100 tonnes with a total estimated value of N$ 126 56 million (average fish market price of N$ 60/kg fish at Katima Mulilo fish market).This represent a loss in income of N$30 million due to declining fish populations as a result of over fishing and use of illegal fishing gears (monofilament nets) and illegal fishing methods like drag netting.

During the period under review 7 gazette notices were drafted for gazetting of 7 fisheries reserves on the Quando/Chobe Rivers to improve management of the resource as Fisheries Reserves in Baleyerwa conservancy, Mayuni Conservancy, Nakabolelwa and Lusese conservancies.

The Lower Orange River and the state dams in the Hardap, //Karas, Erongo, Omaheke and Khomas regions play an important role in the daily lives of the people by contributing about 2.6 tons in 2019 at an estimated value of N$ 156,000.00 at N$60/kg price. Inland fisheries database does not provides a fully accurate characterization of the landing stock due to significant uncertainty in most of the water bodies in terms of the catch data and consumption data. Three events (National, Prestige and Region 5) of recreational fishing activities took place at Naute dam and Hardap dam during 2019/20.

7.2 **FRESHWATER AQUACULTURE**

There are currently four aquaculture centers producing fingerlings in the north of Namibia for the production of fish by Small Scale Fish Farmers (SSFF), farmers, cooperatives and MFMR fish farms (Epalela). The Inland Aquaculture Centers produces 3-Spot tilapia (*Oreochromis andersonii*), Redbreast tilapia (*Coptodon rendalii*), and African catfish (*Clarias gariepinus)* fingerlings. These centers include Onavivi Inland Aquaculture Center (Onavivi IAC), Ongwediva Inland Aquaculture Center (OIAC), Kamutjonga Inland Fisheries Institute (KIFI), Zambezi Inland Aquaculture Center (ZIAC). Rundu IAC is still under construction. Mpungu and Epalela fish farms are the only Government fish farms in the north of the country responsible for growing fish to market size and sale to the community at a low price of N$15-20/kg. The cost of fish feed increased from N$8.50/kg during 2018/19 to around N$12/kg due to the severe draught. GRN fish farms in the north secured a project on training in climate adaptive aquaculture and Inland Fisheries under the Intra ACP GCCA Project that delivered 3 training sessions on (1)Climate adaptive Aquaculture, (2) Climate adaptive Inland Fisheries and (3) the impact of Climate Change on aquaculture and Inland Fisheries.

GRN fish farms in the north produced a total of 1 181 050 tilapia fingerling and 90 292 catfish fingerling. A total of 29.605 tonnes of freshwater fish was produced on GRN fish farms during 2019/20 with a feed conversion ratio (FCR) of 1.76:1 (1.76 kg of feed required to produce 1 kg of fish) and a resulting production cost of N$25.14/kg of fish (feed cost N$10/kg and the assumption that feed cost is 70% of production cost).



Figure12 : Aquaculture Tilapia all-male and catfish stocking density trail 2019/2020

In the south the Hardap Aquaculture Inland Center (HAIC) hatchery produced 146,219 fingerlings of Mozambique tilapia (*Oreochromis mossambicus)* and distributed 32,955 fingerlings to 45 small scale fish farmers and aquaponics farmers in Omaheke, Hardap, //Karas, Erongo, Khomas and part of the Otjozondjupa as well as stocked 22,500 fingerlings at Leonardville Fish Farm (LFF), 5,900 fingerlings at Fonteintjie Fish Farm (FFF) and 16,765 fingerlings at HIAC for fish production. About 0.559 and 4.041 tonnes of tilapia (*Oreochromis mossambicus)* were harvested at HIAC and LFF respectively and sold at N$15/kg. The SSFF recorded about 6.84 tonnes of fish harvest during the period under review.

The division provided extension and advice services to 25 registered small-scale fish farmers (SSFF), potential fish farmers and public. This include: conducted 10 site assessments, registered 8 new, hands-on training, regular biological fish sampling and fish harvests. The division has also provided about 5.1 tonnes of fish feed to 45 small scale farmers in the Omaheke, Khomas, Erongo, Otjozondjupa, Hardap and //Karas Regions.

A Fish Farm Management Plan (FFMP) for Leonardville fish farm was developed. All male fingerling production was implemented at HIAC. Sampling activities at all centres were carried out without major challenges. A total of 146,219 fingerlings were produced and 77,820 were distributed/stocked at GRN and as well as SSFF.

MARINE AQUACULTURE

Mariculture in Namibia mainly focuses on molluscan shellfish (oysters and abalone). These species are best suited to the very productive upwelling system of the northern Benguela. The DoAIF carries out Water Quality Monitoring and Aquatic Animal Health and Biosecurity

Monitoring Programmes to provide timely information of the occurrence or imminent occurrence of any pollution or natural phenomenon which may have a harmful or detrimental effect on the aquatic environment or any aquaculture product to mariculture industry and public. The information provides the status of molluscan shellfish food safety and aquatic animal health which is important to promote commercial trade to international markets. The Namibia Standards Institution (NSI) provides the laboratory testing services to mariculture industry to facilitate trade.

A total of 21 sampling points in Walvis Bay, Swakopmund, Henties Bay and Lüderitz) were monitored during the time under review. Six (6) oyster farms, one (1) oyster hatchery and two (2) abalone farms are operational in the coastal towns. A total of 395 phytoplankton samples (249 samples from Walvis Bay and 146 from Lüderitz area) were taken from sampling points along the Namibian coast.



Figure 13: Abalone Farm in Lüderitz

The total Mari culture production that was exported from Namibia for the period 2019/2020 was about 188.31 metric tonnes valued at about N$13 million. The main export markets were China, Russia and South Africa. Interests have been indicated by the industry to diversify into other species such as seaweed and scallops.



Figure14 : Sorting of oysters on land

8 HUMAN RESOURCE

HUMAN RESOURCE DEVELOPMENT

This program is aimed at equipping staff members with different skills and abilities, through training and development programs in various fields at all levels in the Ministry mainly through sponsored courses, mandatory course and Induction and Orientation. During 2019/20 financial year, the Ministry administered scholarships in fields such as administration, research and aquaculture production. Due to budget cuts, and in line with MTEF targets, limited resources were allocated to staff development in 2019/20.

The following table shows a staff development record during the period under review:
Table;27

LEVEL	TYPE	MALE	FEMALE	TOTAL
STAFF BELOW MANAGEMENT	Skills Development (non-qualifying)	21	9	**30**
	Induction and orientation	35	26	**61**
	Sponsored Scholarships Courses (Qualifying)	2	5	**7**
TOTAL		**58**	**40**	**98**

Skills Development Training

- The various skills development courses were attended by **Ninety one (91)** staff members from various directorates of the Ministry. These included courses on In-house Induction, fisheries, aquaculture, and mandatory courses. Most of the short term training were attended locally, whereas few of the courses were attended outside the country as sponsored courses, mainly due to lack of funds.
- During the period under review, an amount of N$50 000 was utilized for the purpose of improving skills for staff members under the short term courses.

Bursaries and scholarships

- During the reporting period the Ministry facilitated two (2) sponsored scholarships five (5) self-funded courses both locally and abroad, mainly in areas of Business Administration, Natural Resources and Marine Engineering.

Student Internship

The Ministry also assisted **Twenty Five (25)** university students to gain job training attachments under the supervision of permanent staff members. Most of the internships undertaken varied from one month to six months and in areas of Administration, Human Resources Management, Economics, Information Technology, Fisheries and Aquaculture Management.

1. Human Resources Division:

The sub-division is responsibly to render an efficient and effective Human Resources management functions to the ministry by providing professional human resources management service in accordance with the Public Service Act, Public Service Staff Rules and Procedures, Labor Act, Affirmative Action Act and other relevant legislation.

The following statistics reflect the human resources during the period under review:

2019/2020		
	Male	Female
Total Workforce	499	
Appointments	19	18
Resignation	7	3
Death	1	0
Total managers	8	4

The human resources office in collaboration with the various directorates and divisions managed to fill thirty-three (37) posts by means of new appointments and transfers from other O/M/A's ranging from middle management to entry-level and ten(10) staff members resigned during the reporting period.

For the period in question, all general administration functions have been carried out satisfactorily. These include the processing of pensions, medical aid, leaves, housing, and social security.

In addition, the Ministry submitted the Affirmative Action Report for the reporting period in February to the Office of the Prime Minister as well as the Employment Equity Commission. The report was accompanied by the Ministerial Affirmative Action Plan for the next three years (2019to 2021). During this period the Ministry will not have an understudy, as there are no longer any Non-Namibians employed.

Auxiliary Services

The subdivision is responsible for provision of support services to the ministry in terms of maintenance of buildings, managing records, provision of transport and provide secretarial support to the procurement internal structures.

EDRMS

The EDRMS implementation project reached a satisfactory stage of technical implementation in September 2019 and the next phase of the project requires the transition to electronic documents management practices by adopting the EDRMS for electronic filing of important official email messages, scanning and uploading of official documents, retrieval of electronic official documents, and the borrowing of official documents. Staff have been encouraged to use EDRMS to help to improve records management practices in Ministry of Fisheries and Marine Resources.

Procurement
The Ministry awarded the following contracts during the reporting period:

Services	Location	Company	Procurement #	Contract Duration	Starting Date	Er

Security Services	Henties Bay House, Henties Bay Office Walvis Bay Office, MFMR Vessels (Walvis Bay)	Omambudu Security Services	NCS/ONB/022-17/2019	24 Months	1-Feb-20
Security Services	NatMIRC, Arandis Hanger	Ombala Security Services cc	NCS/ONB/022-17/2019	24 Months	1-Feb-20
Security Services	Luderitz Regional Office, Fonteintjie Fish Farm	Afican King Security Services cc	NCS/ONB/022-17/2019	24 Months	1-Feb-20
Security Services	MFMR Head Office, Hardap Inland Aquaculture Centre	Bertha Security Services cc	NCS/ONB/022-17/2019	24 Months	1-Feb-20
Security Services	Epalela Fish Farm, Onavivi Fish Farm	Jupiter Security Services	NCS/ONB/022-17/2019	24 Months	1-Feb-20
Security Services	Mpungu Fish Farm, Rundu Regional Office	Shilimela Security and Debt Collect	NCS/ONB/022-17/2019	24 Months	1-Feb-20
Lease of eleven photocopy machines to the Ministry of Fisheries and Marine Resources	All MFMR Offices	Nashua Namibia Co. (Pty) Ltd	NCS/ONB/022-18/2019	36 Months	
Security Services	Oshakati Staff Housing, Ongwediva IAC	Omle Security Services	NCS/ONB/022-17/2019	24 Months	1-Feb-20
Security Services	Katima Mulilo IAC, Kamutjonga IFI	Royal Security Services Cc	NCS/ONB/022-17/2019	24 Months	1-Feb-20
Waste management services	MFMR Head Office	Rent-A-Drum (Pty) Ltd	NCS/ONB/022-03/2019	36 Months	1-Dec-19
Maintenance, Repair, Overhaul of Fire Fighting, Rescue and lifesaving Equipment	the Vessels belonging to the Ministry of Fisheries and Marine Resources Coast	Benguella Enterprises (Pty) Ltd	NCS/ONB/022-20/2019	36 Months	1-Feb-20
Management and operation	Research Vessels !Anichab		NCS/ONB/022-02/2019	36 Months	1-Nov-19
Maintenance, Repair, Overhaul and Servicing of main engines, auxiliary engines and gear boxes with related parts for the Patrol and Research Vessels	MFMR	Namib Diesel cc	NCS/ONB/022-19/2019	36 Months	1-Feb-20
Maintenance of the Ministry of Fisheries and Marine Resources patrol aircraft and the supply of related parts	MFMR	SkyCore Aviation (PTY) Ltd	NCS/ONB/022-15/2019	36 Months	1-Feb-20

Maintenance, Repair and Overhaul of Electrical, Electronic and Automation for The Vessels	MFMR	Namib Diesel cc	NCS/ONB/022-09-2019	36 Months	1-Aug-19
Maintenance, Repair, Overhail of Hydraulic Machinery for the Vessels	MFMR	Elgin Brown & Hamer Namibia (Pty) Ltd	NCS/ONB/022-05/2019	36 Months	1-Aug-19
Maintenance , Repair and Overhaul of General Machinery with related system such as anchor windless and equipment, capstans, hoisting, gears, evaporators, pumpswith related piping, cooler, heaters, valve, strainers, filters for vessels	MFMR	Elgin Brown & Hamer Namibia (Pty) Ltd	NCS/ONB/022-12/2019	36 Months	1-Aug-19
Maintenance, Repairs and Overhaul of Hull, Superstructure and Accommodation for the Vessels	MFMR	Elgin Brown & Hamer Namibia (Pty) Ltd	NCS/ONB/022-08/2019	36 Months	1-Aug-19

9. International Fisheries Relations

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

The organisation is mandated with the conservation and management of marine living resources in the Antarctic and Southern Oceans, mainly, Toothfish, Krill, Icefish and Crab resources. In October 2019, Namibia attended the annual CCAMLR meeting held in Hobart, Tasmania (Australia). Although, Namibia did not fish in the CCAMLR Convention Area during 2019, the country contributed to the formulation and adoption of many Conservation Measures made at the annual meeting, some of which could have far reaching consequences for Namibia and the rest of the developing world.

Following deliberations at the 2019 annual meeting, the following recommendations which are relevant to Namibia were made:

- It is recommended that Namibia closely monitors progress on the proposed establishment of Marine Protected Areas (MPAs), as well as the accompanying Research Monitoring Plans (RMPs), in order to ensure that the CCAMLR Convention area remains accessible for fishing by all members intending to fish in the Convention area in the future.
- It is further recommended that Namibia explore all the factors that may be hindering her fishing companies to apply for fishing opportunities in the CCAMLR Convention Area, before further sensitizing the fishing industry to take up such opportunities. During previous consultations with fishing companies, some have expressed concerns over the Joint Venture formations in the granting of new fishing rights, as well as some Immigration requirements, as amongst those factors that hinder them from applying for fishing opportunities in international waters.
- Considering the distance from Namibia to the CCAMLR fishing grounds, as well as the special conditions (such as ice water) that require specialized vessels and equipment to undertake fishing in those areas, it is strongly recommended that Namibian Fishing Companies intending to fish in CCAMLR waters enter into joint ventures with Fishing Companies from other CCAMLR member states who have the experience and capacity to fish in that area.
- It is further recommended that candidates from Namibia, who met the criteria for the CCAMLR Scholarship Scheme, consider applying for such opportunities and in this regard also for Namibia to participate in the High-Level Panel on Capacity Building, to advance the training needs of Namibia.
- It is also recommended that Namibia gets in touch with the CCAMLR Secretariat to facilitate the training of some Namibian University graduates as International Scientific Observers, as this would equip them with the relevant knowledge and

skills to serve as observers onboard foreign fishing vessels, in addition to the role they perform in the Namibian EEZ.

Annex 1: Useful contacts

Institution and contact details	Mandate
Ministry of Fisheries and Marine Resources (MFMR)	
Head Office, Private Bag 13355, Brendan Simbwaye Square, Block C, Corner of Uhland & Goethe Streets, Windhoek, Namibia. Tel: +264 61 2059 (switch) Fax: +264 61 233 286 www.mfmr.gov.na	Office of the Minister, sectoral policy, planning and economics, fisheries administration, legislative controls, data collection and analysis.
National Marine Information and Research Centre, (NatMIRC), Strand Street, Box 912, Swakopmund. Tel: +264 64 410 1000 (switch) 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 head 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	Freshwater fish and invertebrate research, migrations of freshwater fishes using radio tagging, development of freshwater aquaculture techniques

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	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 64 201 6228	Monitoring, control and surveillance of marine commercial and recreational fisheries.
Namibian Maritime and Fisheries Institute (NAMFI), PO Box 3228, Walvis Bay. Tel: +264 64 203 114 Fax: +264 64 203 112	Main institute providing education and training for MFMR staff, including Fisheries Inspectors, Fisheries 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	Management and administration of the MFMR Fisheries Observer Programme.
Fishing industry associations: Pelagic Fishing Association Hake Association Midwater Trawling Association Monk and Sole Association	All have a common secretary. Write to: PO Box 2513, Walvis Bay, Namibia. Phone: +264 (0)64 20 9083. Fax: +264 (0)64 20 6158.

Tuna and Hake Longlining Association Deepwater Fishing Sector	E-mail: hardrud@iafrica.com.na

Annex 2: Ministry of Fisheries and Marine Resources Structural organogram.

