



REPUBLIC OF NAMIBIA

NATIONAL PLAN OF ACTION (NPOA) FOR THE MANAGEMENT OF FISHING CAPACITY

Ministry of Fisheries and Marine Resources
REPUBLIC OF NAMIBIA

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PART A

PROFILE OF NAMIBIA'S MARINE CAPTURE FISHING INDUSTRY

1 INTRODUCTION

Namibia is bordered by South Africa, Botswana, Zambia, Zimbabwe and Angola in south western Africa. Some 12 small uninhabited islands lie off the coast between Walvis Bay and the Orange River. Predominantly an arid country, its topography can be divided into four general areas: the Namib Desert and coastal plains in the west; the eastward-sloping Central Plateau; the Kalahari Desert along the Botswana and South African borders; and the densely wooded bushveld of the northern Kavango and Caprivi regions. Namibia has been an independent republic since 21 March 1990. It is administratively divided into 13 regions, each with its own regional government. Namibia's prosperous economy is dominated by mining (diamonds and uranium), fishing and tourism. Cattle and sheep herding and subsistence agriculture are also important. GDP is around twice the average for African states.

Namibia's low population results in one of the lowest population densities in Africa. Approximately 75% of the population reside in rural areas, predominantly inland. As a consequence, there is virtually no marine subsistence fishing sub-sector.

2 NAMIBIA'S MARINE FISHERIES SECTOR

Largely as a result of up-welling of the nutrient-rich Benguela Current, Namibia's waters are highly productive. Prior to Namibian Independence in 1990, uncontrolled fishing on a massive scale by foreign fleets greatly reduced the abundance of all the major fish stocks. This period was followed by a dramatic recovery of the resources following Independence in 1990 and the implementation of a resource management system that incorporates a highly effective, cost-efficient system of monitoring, control and surveillance.

More than 20 commercially important species are landed. Landings in 2004 totalled 567,133 tonnes, taken by around 334 vessels licensed to fish in Namibian waters, around 80% of which were Namibian flag. Some vessels have multiple licences allowing them to target more than one species. The marine sector can be divided into the following main fisheries:

Demersal fisheries

Around 106 demersal trawlers are currently licensed.

A fleet of 62 wet-fish trawlers (23 – 70 m length) and 25 freezer trawlers (24 – 73 m length) target **hake** (*Merluccius capensis* and *M. paradoxus*), caught in deeper water (trawling is not permitted in less than 200 m depth). Twenty-four demersal long-liners (19-42 m length range) also target hake, with smaller quantities of highly valuable kingklip (*Genypterus capensis*) and snoek (*Thyrsites atun*).

Hake is by far the most valuable of Namibia's fisheries. In 2005, total landed value of Namibian fisheries was some N\$2,800 million, of which around 67% came from hake; and the total final value was around N\$3,344 million, of which almost 69% was hake.

Hake-directed fisheries also take about 35% of the monkfish catch as a by-catch, although high by-catch fees are applied to discourage targeting of monkfish by hake fishers. (Discarding is not allowed.)

The table below shows the development of the hake fishery over the past 6 years. Note that the TAC for 2006 has been cut to 130,000 tonnes.

HAKE						
Year	2000	2001	2002	2003	2004	2005
TAC	194 000	200 000	195 000	180 000	195 000	180 000
Landings	171 397	173 277	154 588	189 305	173 902	137 605
Demersal Trawlers	111	128	114	100	125	121
Longliners		38	10	8	17	28
Landed value (N\$ million)	1 058	1 188	1 245	1 808	1 695	1 884
Final value (N\$ million)	1 582	1 731	1 924	2 619	2 410	2 300

Monk and sole fishery

Nineteen trawlers (19 – 38 m length) fish more inshore for **monkfish** (*Lophius spp.*), **sole** (*Austroglossus microlepis*) and **kingklip**. Catches in 2004 were hake – 173,902 tonnes; monkfish – 8,961 tonnes; and kingklip – 7,067 tonnes.

The table below shows the TACs set and landings in 2000 to 2005. The table also shows the landed and final value of catches as well as the boats licensed in the respective years. The number of licensed vessels increased from 24 in 2004/5 to 27 in 2005/6 season.

The landings trend has remained stable over the years, however low landings were experienced during 2004/2005 fishing season that saw a decline of 15% from the previous fishing season, i.e. 2003/2004 (see Table below). The monk fishery was unable to land their allocated portion of the TAC, having an aggregate of 75% of landings of the allocated monk TAC between the 2003/2004 and 2005/2006 fishing seasons. During the 2005/2006 fishing season the industry landed 7102.85mt.

Monk & Sole						
Year	2000/1	2001/2	2002/3	2003/4	2004/5	2005/6
TAC	13 000	12470	12000	12500	12000	11000
Landings	14358	9178	10058	9618	8135	7102.85
Trawlers	23	26	28	26	24	27
Landed value (N\$ million)	64.6	55.1	67	49.2	33.2	36.7
Final value (N\$ million)	71.8	61.2	74.4	54.7	36.9	40.8

Despite being one of the most expensive fish, Namibian Monkfish continues to be a highly sought-after product on the European markets and is 100% exported. The demand for monkfish products saw an increase from countries such as Germany, South Africa and Portugal during 2005 amounting to 3% of total exports as compared to 0% in 2004. In 2003, 947mt were exported compared to 168mt in 2004 and this could be because of the low fish stocks, i.e. poor catches. An amount of 1 040mt was land frozen and 1 513mt in 2004 and 2003 respectively. Approximately 5 364mt was sea frozen in 2004. An amount of 2 713mt was exported in 2004 compared to 3 740mt in 2003 showing a decline of 27%, hence; the reduced TAC, the value of production decreased from 199 601mt to 118 786mt.

Monkfish known variously as the goosefish, anglerfish or all-mouth is mainly processed onboard vessels into various product forms such as fillets, headed and gutted and frozen portions. Others are exported frozen whole and in other frozen forms to export markets.

The final value of the monk fish was 40.8 million in 2005/6. It is higher than the previous season which also had a higher TAC and higher landings.

The monkfish fishery targets monkfish with a bycatch of sole and hake.

Mid-water fishery

The second most valuable fishery in Namibia after hake is that for **horse mackerel** (*Trachurus capensis*). It is the most important Namibian fishery in terms of the weight of catch, representing between 55% and 60% of the total volume of Namibian catch.

The fishery is highly capital-intensive using vessels in the 62 – 120 metre length range. About 26 mid-water freezer trawlers have been licensed to fish for horse mackerel, but only 15 in 2005.

HORSE MACKEREL						
Year	2000	2001	2002	2003	2004	2005
TAC	410 000	410 000	350 000	350 000	350 000	350 000
Landings	344 314	315 245	359 183	360 447	310 405	308 365
Mid-water Trawlers	26	24	20	26	24	15
Landed value (N\$ million)	663	877	992	788	538	690
Final value (N\$ million)	669	881	996	796	548	698

Purse-seine fishery

A fleet of 14 purse-seiners (21-51 m length) target pilchard (*Sardinops ocellatus*) for canning. Juvenile horse-mackerel and anchovy (*Engraulis capensis*), which occurs sporadically in Namibian waters, are also taken for fish meal. Namibia's pilchard stock has not responded to measures designed to re-build stocks, and there is concern for recruitment levels which appear to be largely influenced by environmental factors. Catches have fluctuated widely in recent years. A moratorium was declared in 2002. Landings in 2005 totalled 25,128.

Pilchard						
Year	2000	2001	2002	2003	2004	2005
TAC	25 000	10 000	0	20 000	25 000	20 000
Landings	25 388	10 763	4 160	22 255	28 605	25 128
Purse-Seiners	29	23	25	19	15	14
Landed value (N\$ million)	16.8	6.4	0.9	17.9	22.6	20.2
Final value (N\$ million)	97.2	49.6	61.2	127.4	147.4	130.1

Deep-water fishery

Four deep-water trawlers (19 – 31 m length) are currently licensed to target orange roughy (*Hoplostethus atlanticus*) and alfonsino (*Beryx splendens*). The fishery commenced in 1994.

Orange Roughy						
Year	2000	2001	2002	2003	2004	2005
TAC	2400	1875	2400	2650	2600	2050
Landings	1379	699	1831	1438	1118	267
Number of Vessels	5	3	6	5	5	4
Landed value (N\$ million)	21.4	13.6	21.6	20.7	24.4	4.4
Final value (N\$ million)	31.2	19.2	31.4	33.9	35.6	6.1

Tuna fishery

A fleet of 37 tuna vessels (15 - 81m length) utilising long-line and pole-and-line gear are licensed to target albacore (*Thunnus alalunga*), bigeye (*Thunnus obesus*), swordfish (*Xiphias gladius*) and skipjack (*Katsuwonus pelamis*). Pelagic sharks are also taken. Namibia is an active member of the International Commission for the Conservation of Atlantic Tunas (ICCAT) and participates fully in regard to regional assessment and management for these species. A total of 3,581 tonnes of tuna were landed in 2004.

Rock lobster fishery

The fishery for rock lobster (*Jasus Ialandii*) is based in the southern port of Lüderitz. Thirty-nine vessels (6-53 m) are currently licensed and use lobster traps. The rock lobster stock is showing signs of continued growth. In 2004 a total of 214 tonnes was landed.

Deep-sea red crab fishery

Deep-water traps are used to target red crab (*Chaceon maritae*). Three vessels (49 – 56 m length) are currently active in this small but valuable fishery. Research on deep-sea red crab indicates that stock size continues to grow slowly. Being a shared stock, Namibia has initiated joint research activities with neighbouring Angola. Catches in 2004 totalled 2,400 tonnes.

Commercial Line-fishing

A fleet of 16 industrial line fish vessels (5 - 35 m length) operate offshore and target kob, steenbras, snoek and galjoen. In addition, recreational fishing occurs along the coastline using beach-caster rods. Main target species include blacktail (*Diplodus sargus*), galjoen (*Dichistius*

capensis), kob (*Argyrosomus spp.*), snoek (*Thyrsites atun*), West Coast steenbras (*Lithognathus aureti*), and bronze whaler shark (*Carcharhinus brachyurus*).

Cape fur seals (*Arctocephalus pusillus*) are also harvested around Cape Cross, Wolfs Bay and Atlas Bay. In 2005, around 59,205 animals were harvested. Seaweed, predominantly kelp, is harvested at a number of locations. Production in 2005 was around 290 tonnes.

2.1 CATCH UTILIZATION

Essentially all of the fishing industry is based in two ports: Walvis Bay and Lüderitz. Some line fish vessels also land at Swakopmund. Namibian fisheries policy has driven the development of a strong on-shore handling and processing sector. Exports include fresh and frozen round, gilled/gutted and processed forms (fillets, steaks etc).

Since Independence many demersal fish processing plants have been upgraded or established and include some of the most advanced fish processing factories in the world. Government policy to encourage processing of white fish on land has resulted in considerable expansion of employment. Current objective is to have 70% of the hake quota processed ashore by 2008.

Adult horse mackerel taken by the mid-water trawl fleet is frozen at sea. All production is consumed in the SADC Region, the main markets being Democratic Republic of Congo Mozambique and South Africa. A proportion is also salted and dried ashore for the domestic market and neighbouring countries. The mid-water sector also produces fish meal from horse mackerel (around 13,600 tonnes of fish meal in 2003). Around 40,000 tonnes of the horse mackerel TAC is allocated each year to the purse seine fleet, which targets juvenile horse mackerel for the production of fish meal. Other pelagic species such as anchovy and round herring are also utilised in this way. The purse seine sector produced around 14,100 tonnes of fish meal in 2003.

Most of the pilchard quota is used for canning. The dominant market for canned product is South Africa, although European markets (e.g. UK) are growing in importance. Small quantities are also sold for bait or processed into fish meal.

Monkfish and sole are exported mainly to France, Italy, Japan, and China. Orange roughy and small amounts of alfonsino are exported to USA.

The bulk of Namibian hake is mainly exported to EU markets, Spain being the main destination. A wide variety of processed products are exported, mainly frozen but also refrigerated, where they are then distributed throughout EU markets. Other markets for hake are being developed, including Australia and USA.

Rock lobster and deep-sea red crab are exported mainly to Japan. Tuna is exported to Spain, USA and Japan.

3 ECONOMIC ROLE OF THE FISHING INDUSTRY

Total direct employment in 2005 was estimated to be 13,500 people, of which some 5,575 (68% Namibians) are employed on-board vessels and 7,925 (98% Namibians) work ashore.

The fisheries sector has consistently been the second largest sector in the Namibian economy behind mining in terms of export earnings. Although the contribution of income from marine resources to GDP has fluctuated over the years mainly due to the unpredictable nature of the resource, it showed an overall increase from N\$288 million (4%) in 1991 to N\$2 526 million (7.8%) in 2003. The value of fisheries production has also increased substantially since 1991 mainly due to an increase in the prices obtained in the export markets as well as value addition. Landed value has increased from N\$520 million in 1991 to N\$2 638 million in 2003. Final value has increased from N\$644 million in 1991 to N\$3 668 million in 2003. Since an estimated 97% of total fish production is exported, the value of exports closely follow the same trend as final value and has also increased substantially from N\$631 million in 1991 to N\$3 506 million in 2003.

Direct Government revenues collected from the fisheries sector include quota fees, Marine Resource levy fund (a levy on all landed species, used to fund research and training), a by-catch levy (all of which must be landed – discarding is prohibited) with charge rates per tonne set on a species specific basis, and licence fees for vessels and processing facilities. These direct revenues totalled just over N\$100 million in 2003. It is estimated that the revenue generated by recreational fishing is in excess of N\$30 million per year.

In addition, Namibia's fishing companies provide finance and other forms of assistance for the construction of schools, clinics and other much-needed civic facilities. The contribution made over the past 14 years runs in excess of N\$40 million.

4 POLICY AND ADMINISTRATION

Management and development of fisheries in Namibia is the responsibility of the Ministry of Fisheries and Marine Resources (MFMR). MFMR's Mission Statement is: "To strengthen Namibia's position as a leading fishing nation and to contribute towards the achievement of our economic, social and conservation goals for the benefit of all Namibians". Since independence, policy for the sector has been, and continues to be, driven by the following key document: Towards Responsible Development of the Fisheries Sector (1991, revised 2004).

5 FISHERIES LEGISLATION

The two primary legal instruments governing marine fisheries are:

- Territorial Sea and Exclusive Economic Zone of Namibia Act (no. 3 of 1990);
- Marine Resource Act (no. 27 of 2000).

At Independence, the Government proclaimed a 200 nm zone (EEZ) in accordance with the provisions of the United Nations Convention on the Law of the Sea of 1982.

The Marine Resources Act (2000) and Regulations Relating to the Exploitation of Marine Resources (2001, as amended) provide the basic legal framework for management and regulation of the marine fisheries sector. This Act was developed in the late nineties, following Namibia's accession to various international fisheries conventions, agreements and

arrangements, which prompted a revision of the Sea Fisheries Act (1992). The Act sets forth the details of a rights-based management system, the main elements of which are outlined below.

5.1 FISHING RIGHTS

Fishing rights, or rights of harvest, are the central element of the fisheries management regime. The Marine Resources Act states “No person shall ... harvest any marine resource for commercial purposes, except under a right...” The main purpose of fishing rights is to limit entry to the fisheries sector in order to protect the fisheries resources and maintain sustainable operations. Fishing rights are granted for a period of 7, 10, 15 or 20 years depending on various factors, in particular the level of investment and the level of Namibian ownership and employment. Fishing rights are not freely transferable in Namibia, so as not to undermine the Government's goals of Namibianisation and empowerment within the sector. The total number of existing rights in 2003 was 159.

5.2 FISHING LICENCES

All vessels are required to obtain a licence in order to fish commercially within Namibia's 200-mile exclusive economic zone (EEZ). Namibia executes its flag-state responsibility by requiring all vessels that fly the Namibian flag to also have a specific licence to harvest any marine resources in waters outside of the Namibian EEZ.

5.3 TOTAL ALLOWABLE CATCHES

Total allowable catches (TACs) are set annually for seven species: pilchard, hake, horse mackerel, red crab and rock lobster, orange roughy and monk. TACs are established on the basis of the best scientific evidence available concerning the size and structure of stocks as determined by the fisheries scientists employed by the Ministry. TACs aim to ensure sustainable fishing operations; that the level of fishing effort does not undermine the status of each stock.

5.4 INDIVIDUAL (NON-TRANSFERABLE) QUOTAS

Once a TAC has been set for a fishing season, it is distributed among the right holders in each fishery in the form of quotas. The main purpose with the quota allocation is to promote economic efficiency – to give companies sufficient knowledge about expected catch levels for the year for proper planning of their fishing activities. Quotas are not permanently transferable for the same reasons that rights are not transferable.

Marine catches are landed mainly at two major ports: Walvis Bay (90% of total) and Lüderitz (10% of total). The absence of an artisanal sector makes monitoring of catches relatively easy.

5.5 FEES

Fees form an important part of Namibian fisheries management. Their role is twofold: firstly, to earn revenue for the government, and secondly to create incentives that work towards the goals of the management system, both conservation and Namibianisation. The most important are quota fees, which are payable on allocated quota.

By-catch fees that are applied in order to deter right holders from targeting species other than those for which they have been issued a quota. Such fees provide an incentive to avoid catching non-target species. The levels of by-catch fees are carefully balanced to discourage the capture of non-target species, but are also not so punitive as to encourage dumping. A certain percentage of by-catch in the hake-directed fishery is not levied, since a reasonable amount of by-catch can not be avoided.

A Marine Resources Fund levy is imposed per tonne of landed catch to finance fisheries research and training initiatives. Licence fees are applied to fishing vessels in order to legally fish within Namibia's waters. Each year between 300 and 350 vessels are licensed by the Ministry.

5.6 GIVING EFFECT TO INTERNATIONAL FISHERIES AGREEMENTS

The President may enter into a fisheries agreement with a member country of the Southern African Development Community (SADC), providing for such country to harvest marine resources in Namibian waters. Such agreements may be published in the gazette. For any fisheries or international agreements entered into by Namibia, the Minister is empowered to make regulations necessary to give effect to such agreements. Texts of all conservation and management measures adopted under any fisheries or international agreement to which Namibia is a party may be published in the national Gazette.

5.7 MANAGEMENT AND CONSERVATION MEASURES

The Minister of Fisheries and Marine Resources can determine necessary management and conservation measures, including TACs, effort limitations, fishing-gear specifications, protection of juvenile fish through measures such as minimum allowable mesh size, grid selectivity device, minimum fish sizes to be landed, restrictions on by-catch, temporal and spatial closures and measures for shared/straddling stocks.

5.8 MONITORING, CONTROL AND SURVEILLANCE

Namibia's MCS system has evolved over the years into what is today widely regarded by the international community as a very effective system. A crucial element has been the financial, human and material support from the Namibian government. The costs to Government and industry of MCS and other management activities have been kept commensurate with the value of the sector. An integrated program of inspection and patrols at sea, on land and in the air ensures continuing compliance with Namibia's fisheries laws. The major features of the program are described below.

5.8.1 Fisheries Observer Programme

Emplacement of fisheries observers on board larger vessels serves both to ensure compliance and the collection of scientific data. Coverage rates range from 70-100%, depending on the fishery in question. The establishment of the new Fisheries Observer Agency under the Marine Resources Act will improve current capacities in this regard.

5.8.2 Compliance and Enforcement

The Act specifies the powers of enforcement officers in regard to stopping and boarding vessels, search and inspection, hot pursuit, seizure, and arrest. It provides for the establishment and functions of a Fisheries Observer Agency, which is charged with the collection of scientific operational data onboard fishing vessels, and observation and reporting on the fishing activities thereof.

5.8.3 Sea, air and shore patrols

Systematic sea patrols aim to ensure compliance with fishing conditions by licensed vessels through regular at-sea inspections. Air patrols detect and deter unlicensed fishing vessels and monitor the movement and operations of the licensed fleet. Shore patrols ensure compliance by both recreational and commercial fishers with conservation measures for inshore resources.

5.8.4 Monitoring of landings

Complete monitoring of all landings at the two commercial fishing ports, Walvis Bay and Lüderitz, by onshore inspectors ensure compliance with quota limits and fee payments. Transshipping fish at sea between catching vessels and carrier vessels is prohibited – all fish must be landed at a Namibian port. This feature of the management system ensures comprehensive monitoring of catches.

5.8.5 Vessel reporting

All vessels are required to supply EEZ exit and entry reports, as well as daily catch and effort reports via radio and in the form of vessel log-sheets.

5.8.6 Vessel monitoring system

Namibia is well advanced in implementing a national satellite-based vessel monitoring system (VMS). The system will benefit fisheries management in real-time monitoring of vessel movement and activities. The system that has been chosen is already in use in the United Kingdom, Germany, United States, Morocco, and, closer to home, South Africa and Mozambique. Namibia is fully supportive of collaborating in the development of a cost-effective, regional VMS.

5.9 OFFENCES AND PENALTIES

Section 52 of the Act provides for offences and penalties for violations of the Act. Unauthorised fishing or contravention of licence conditions by Namibian or foreign flag vessels attract a fine of up to N\$2 million. Assaulting or hindering any officer authorised under Namibian law or an international agreement to which Namibia is a party can face a fine of up to N\$1 million. Other sections of Part IX of the Act provide for forfeiture, jurisdiction and admissible evidence.

5.10 INTEGRATED DECISION-MAKING

MFMR habitually consults extensively with the stakeholders on matters before action is taken to adjust any aspect of policy or management strategy. A number of consultative mechanisms are in place.

- Direct face to face meetings with individual companies or groups of companies for sector-specific matters;
- Through the various fishing associations;
- Through the annual consultation between the Minister and industry on the state of the fisheries sector;
- Through formal written communications from companies to the office of the Permanent Secretary;
- Consultation and peer review of research undertakings is facilitated through a number of working groups, e.g. the Hake Working Group and the Horse Mackerel Working Group. Industry representatives are members of such working groups.
- Industry vessels collaborate with MFMR scientists each year in undertaking stock surveys for pilchard, hake, horse mackerel and orange roughy.
- Under the Marine Resources Act (2000), a Marine Resources Advisory Council (MRAC) has been established to provide advice to the Minister on fisheries policy, management and development issues.
- The Ministry has also established a Liaison Group with the Fisheries Observer Agency, to facilitate operational efficiencies and effective cooperation.

6 RESEARCH

MFMR's Directorate for Resource Management undertakes a range of marine research activities. Main activities include stock survey and assessments to determine TACs, gear development (e.g. selectivity devices), oceanography, environmental research and the impact of the environment on stocks. Collaboration with regional and international partners such as BCLME and BEEFIT is a particular feature, as described in section 8.3.

7 TRAINING

Since Independence, MFMR has placed a very high priority on human resource development across the board, from fishermen to vessel skippers, from research scientists to senior managers. Four courses have been developed by MFMR: (a) Fisheries Inspector and Observers Course (9 months duration); (b) Commercial Sampling Programme for Fisheries Observers (3 x 2 weeks); (c) Cadet Programme for patrol boat officers (4 years); and (d) Scientific Technical Assistance course (6 months).

Courses are undertaken at the country's own academic institutions (Namibian Maritime and Fisheries Institute (NAMFI) at Walvis Bay and the Polytechnic of Namibia and University of Namibia (Windhoek). Patrol vessel officers and engineers receive training through on-the-job training with Norwegian technical specialists and also on courses organised with South Africa. The Ministry also utilises training/education opportunities for its staff both regionally and internationally. National scientists undertake various short and long courses leading to diploma, degree and post-graduate qualifications, and MFMR organises regular ad hoc

workshops and seminars into various aspects of fisheries research, development and management, often through regional programmes such as BENEFIT and BCLME.

8 DEVELOPMENT ASSISTANCE

In addition to MFMR's own budgets, considerable assistance has been received in fisheries development, management and training through external economic and technical assistance. All have been donor supported usually with a significant contribution in cash or in kind from the Namibian Government. Bi-lateral assistance has been provided, and many cases continues to be provided, by Norwegian Agency for Development Co-operation (NORAD), Australian International Development Assistance Bureau (AIDAB), Danish International Development Agency (DANIDA), Department for International Development (DFID) UK, Gesellschaft fur Technische Zusammenarbeit (GTZ), Germany, Centrum fur Internationale Migration und Entwicklung (CIM), Germany, Icelandic International Development Agency (ICEIDA), Iceland, Government of Spain, International Centre for Ocean Development (ICOD), Japanese International Cooperation Agency (JICA), and Fonds d'Aide et de Coopération (France).

Multi-lateral assistance has been provided by: Food and Agriculture Organisation (FAO), United Nations Industrial Development Organisation (UNIDO), Commonwealth Fund for Technical Cooperation (CFTC), Global Environment Facility (GEF), and the European Union (EU).

9 INTERNATIONAL AND REGIONAL LAW AND RELATIONS

9.1 TREATIES AND AGREEMENTS

Namibia has signed and in some cases ratified a number of international and regional instruments. These are detailed in Table 1 below.

TABLE 1: MAJOR FISHERIES-RELATED ORGANISATIONS AND INSTRUMENTS TO WHICH NAMIBIA IS A PARTY

Instrument	Ratification/ Acceptance
1982 United Nations Law of the Sea Convention (LOSC)	18 April 1983 (Ratification)
Agreement for the Implementation of the Provisions of the United Nations Convention on the Law of the Sea of 10 December 1982 Relating to the Conservation and Management of Straddling Fish Stocks and Highly Migratory Fish Stocks (Fish Stocks Agreement, 1995)	19 April 1996 (signature); 8 April 1998 (Ratification)
Implementation Agreement Of Part XI Of UNCLOS	28 July 1995 (Simplified procedure)
Agreement to Promote Compliance with International Conservation and Management Measures by Fishing Vessels on the High Seas (1993 FAO Compliance Agreement)	7 August 1998 (Acceptance)
International Convention for the Conservation of Atlantic Tunas (ICCAT)	28 April 1999 (signature); 10 November 1999 (Ratification)
Convention for the Conservation of Antarctic Marine Living resources (CCAMLR)	5 February 2001 (Ratification)
South-east Atlantic Fisheries Commission (SEAFO)	20 April 2001 (signature); 26 February 2002 (Ratification)
INFOPECHE	30 December 1996 (Accession)

Convention on the International Maritime Organisation (IMO Convention)	Ratification in preparation?
Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES)	18 th Dec 1990 (Ratification)

9.2 MEMBERSHIP IN REGIONAL FISHERY BODIES

MFMR co-operates with following regional and international fisheries organisations:

- Southern African Development Community (SADC). The SADC Protocol on Fisheries aims to promote responsible and sustainable use of the living aquatic resources and aquatic ecosystems within the SADC region.
- INFOPECHE: In 2001 Namibia signed a cooperation agreement with this International Fisheries Marketing Advisory Body to establish an INFOPECHE Unit in Namibia's capital, Windhoek. This Unit provides information and technical assistance in fish trade, marketing, processing and new innovations to INFOPECHE member states.
- South East Atlantic Fisheries Organisation (SEAFO): establishes a management regime for conservation and sustainable utilisation of fish, molluscs, crustaceans and other sedentary species in the high seas portion of FAO Statistical Area 47, but excluding those sedentary species that are subject to the fishery jurisdiction of coastal States and also tuna and tuna-like species because these fall under the jurisdiction of ICCAT. Namibia is host to the SEAFO Secretariat.
- International Commission For The Conservation Of Atlantic Tunas (ICCAT): The rapid development of a thriving domestic tuna fishery provided the impetus for Namibia to join ICCAT in 1999, becoming the 28th member of the Commission. Namibia welcomes and supports the considerable effort that ICCAT is making in developing comprehensive management tools to deal with, inter alia, IUU fishing in the Atlantic Ocean.
- Commission for the Conservation of Antarctic Marine Living Resources (CCAMLR): As a member of CCAMLR, Namibia is committed to the management and conservation of the marine resources of the Antarctic. The Namibian fishing industry is interested in fishing in CCAMLR's waters and is ready to participate responsibly in the harvesting of fishery resources, especially tooth fish.
- Inter-governmental Oceanographic Commission (IOC): Namibia became the 129th member of the IOC became on 25 April 2001. The IOC is an important facilitator of international oceanographic research programmes and Namibia is involved in its various training, technical assistance and research activities.

9.3 PARTICIPATION IN REGIONAL PROGRAMMES

- SADC Regional Fisheries MCS Programme: Namibia is a partner in this Programme, which operates under the SADC Protocol on Fisheries. The objectives of the programme address the marine fisheries resources of the Region. Capacity building and regional cooperation for MCS are prominent objectives. Expected results of the RDC MCS Programme include:
 - National fisheries MCS systems functioning;
 - Establishment of a basis for the management of shared stocks and international fishing activities
 - Harmonized approaches to the control of international fishing activities

- Marine environment more protected
- Enhanced regional cooperation and communication
- Benguela Environment Fisheries Interaction and Training Programme (BENEFIT): has established a research framework for biological and oceanographic investigation of the entire Benguela Current system. The principal focus of the programme is on resources and resource management research in support of the major fisheries of the three co-operating countries: Namibia, South Africa and Angola. Training of researchers is an important part of the programme as the lack of qualified personnel is a pressing problem in these countries.
- Benguela Large Marine Ecosystem Programme (BCLME): Launched in 2002, BCLME is of global significance, given the stance by the United Nations Conference on Environment and Development (UNCED) to develop an ecosystem-wide approach to environmental research. The programme aims to examine marine environmental variability throughout the Benguela current system and how environmental factors impact on fish stocks and their dependent fisheries.

PART B

NAMIBIA'S NPOA-CAPACITY

I. INTRODUCTION

This national plan of action for the management of fishing capacity (NPOA-capacity) fulfils Namibia's international commitment as an FAO Member State to develop and implement an NPOA in support of the FAO International Plan of Action for the management of fishing capacity (the IPOA-capacity). This commitment is explicitly recognised in section 6.2.1 of Namibia's Marine Resources Policy - Towards Responsible Development of the Fisheries Sector (as revised in 2004).

The NPOA will be responsive to developments in the industry and in the policy framework. In accordance with the IPOA-capacity, a formal review of this NPOA will be undertaken every four years.

The NPOA has been developed and will be implemented in accordance with the guiding principles set out in the IPOA, notably:

- *Participation*: The FAO will be kept informed of progress with the plan. Stakeholders have been consulted in the development of the plan and will continue to be consulted in its implementation. Where appropriate, Namibia will co-operation with other States, or through FAO with other appropriate intergovernmental organizations, including regional fisheries organizations.
- *Phased implementation*: The NPOA will focus initially on the assessment and diagnosis of capacity, followed by the adoption of any management measures required. Assessment and measures will then be monitored regularly.
- *Holistic approach*: The NPOA will consider all factors affecting capacity in both national and international waters
- *Conservation*: The NPOA is complementary to existing fisheries policy. Taken as whole, such policy is designed to achieve the conservation and sustainable use of fish stocks and the protection of the marine environment consistent with the precautionary approach, the need to minimize by-catch, waste and discard and ensure selective and environmentally safe fishing practices, the protection of biodiversity in the marine environment, and the protection of habitat, in particular habitats of special concern
- *Priority*: Priority will be given to managing the fishing capacity in those fisheries in which there already unequivocally exists over fishing
- *New technologies*: The NPOA is designed to take into account the incorporation of environmentally sound and evolving technology in all areas of capture fisheries and processing
- *Mobility*: The NPOA seeks to encourage the efficient use of fishing capacity and to discourage mobility when it negatively affects sustainability

- *Transparency*: The NPOA will be implemented in a transparent manner in accordance with Article 6.13 of the Code of Conduct.

II. POLICY

Article 2 of the Marine Resources Act 2000 (Government Gazette 27 December 2000) establishes that “The Minister may from time to time determine the general policy with regard to the conservation and utilization of marine resources in order to realize the greatest benefit for all Namibians both present and future.”

This objective is given further expression by the Marine Resources Policy (rev 2004), Article 5.2 of which establishes that “The main objective for the marine resources sector is to utilise the country’s fisheries resources on a sustainable basis and to develop responsible industries based on them in a way that ensures their lasting contribution to the country’s economy and overall development objectives, as detailed in VISION 2030 and National Development Plans”.

The Act recognises that overcapacity may threaten the achievement of such objectives and accordingly Article 47(3) states that the Minister may, *inter alia*, “prescribe measures for the conservation of marine resources, for the control of harvesting of such resources and for the protection of the marine environment, including measures to limit the amount of harvesting capacity.”

This recognition is strengthened by the Marine Resources Policy (rev 2004) Article 6.3.1 which seeks to “ensure that catching capacity is kept below the potential of the stocks”.

III. GOAL

In line with the above policy objectives, the goal of this NPOA is to ensure that harvesting and processing capacity do not exceed the levels necessary for the optimum use of the available fish resources and to ensure the sustainability of such resources. Any overcapacity that should emerge will be addressed.

The NPOA considers more explicitly how the fishery management authorities will provide a framework that encourages the fishing industry to maintain a reasonable balance between harvesting capacity and available resources and between processing capacity and the available catch.

To meet this goal, levels of capacity in Namibian fisheries will be monitored and any overcapacity will be quantified. Such quantification will be against management targets set for each of the fisheries.

IV. KEY FEATURES OF NAMIBIAN FISHERIES IN RELATION TO THE IPOA-CAPACITY

The fishery management system that has been developed in Namibia since Independence fulfils many of the recommendations set out in the IPOA.

IV.1 Rights-based fishery management system

The fishery management system is based upon TACs and individual quotas (IQs) with fishing rights allocated to rights holders for periods from 7 to 20 years, depending on a variety of factors, and annual quotas allocated to individual rights holders.

The expectation is that an IQ-managed fishery would not have a significant overcapacity problem and by and large this appears to be the case in Namibian fisheries.

IV.2 Licensing and vessel monitoring

No commercial fishing vessel may operate in the Namibian EEZ without a licence. Moreover, a licence must also be obtained in order to use a Namibian-flagged vessel to harvest any marine resources in any waters outside of the Namibian EEZ. Taken together these two requirements ensure that there is a basic control and monitoring of fishing capacity, defined simply as the number of vessels. This represents an important first step in any capacity management system. The Ministry recognises that more refined definitions of capacity will be needed and intends to develop these on a fishery-by-fishery basis.

Information on the Namibian fishing fleet is held in FIMS (fishing information management system).

From a capacity management viewpoint, the following information held in the database is of particular relevance:

- Right holder
- Name and international call sign of vessel
- Port of registration
- Year built
- GRT
- HP
- Length overall
- Hold capacity
- Type of gear and limitations (e.g. mesh size)

In general, licences are issued annually; although a new licence may be required earlier if a vessel begins fishing for a new right holder.

Capacity-relevant information is thus updated at least annually.

IV.3 Monitoring, control and surveillance

Namibia has a very effective MCS system, which ensures that authorised capacity is utilised in accordance with the regulations and that unauthorised capacity cannot fish.

The system makes use of a range of MCS resources including on-board observers; sea, air and shore patrols; monitoring of landings; marking of vessels and gear in accordance with international standards; vessel reporting obligations and a vessel monitoring system (VMS).

IV.4 Subsidies and economic incentives

The fishing industry is not supported by subsidies (other than some rebates granted on fuel purchases). Section 5.1, Principle 7 of Namibia's Marine Resources Policy (rev 2004) states that: "The marine resources sector shall be self-sustaining and will not be supported through public sector subsidies".

In fact, not only does the sector not receive subsidies, it pays a resource rental in the form of quota levies based on quotas accepted and used by rights holders. And the sector also pays a levy to support research and training and contributes towards the cost of on-board observers. Although not their primary purpose, these different levies can be expected to play some role in reducing fishing capacity compared to what might exist in their absence.

However, one factor that may have contributed to the build-up of some excess processing capacity concerns the way in which fishing rights and IQs are allocated. Section 3.4.1 of the Marine Resources Policy (August 2004) lists elements that will be taken into account in assessing applications for harvest rights. One element (amongst a number of things) concerns the amount of investment in the sector. Some companies seem to have perceived the need to invest in processing and perhaps harvesting capacity in order to demonstrate unequivocally their investment in the sector, thereby securing their harvest rights.

It is difficult to assess the extent to which this one element has driven investment policy. However, it flags up an issue concerning the way in which the fishing industry is perceived in the Namibian economy.

Section 1.4 of the Marine Resources Policy concerns the "role of marine resources in the national economy". The usual indicators are used to assess this role, including contribution to GDP (which is substantial), landed fish value and exports. However, there is another issue to consider which is the investment made in the Namibian economy on the basis of the fish resource wealth. Such investments may come from two sources, quota fees and other revenue going to the Treasury, and profits going to fishing companies and their shareholders.

These investments provide economy-wide benefits to Namibia based on the inherent wealth of the country's fish resources. Focussing on re-investment of this wealth into fishing-related activities may give a misleading guide to the economic importance of the fish resource and the fishing activity.

V. THE MAIN CAPACITY ISSUES AND AN INITIAL ASSESSMENT OF NAMIBIAN FISHERIES

V.1 Capacity issues

Capacity management consists of three basic elements:

- Assessment and monitoring of capacity levels
- Identification of the desired level of capacity (i.e. target capacity)
- Identification of mechanisms to move from the current situation to the desired situation.

Capacity monitoring considers the short run and the long run.

In the short run, two concepts are important. The first is capacity utilisation, which is the ratio of the current output to the potential output under normal working conditions (or alternatively, but not necessarily equivalently, might be the ratio of the number of days actually fished to the number of days the fleet could potentially fish under normal working conditions). Estimates of capacity utilisation will have a value ranging from zero to one.

Changes in capacity utilization over time can provide information on the effectiveness of management in controlling fishing capacity. Declining capacity utilization may indicate that management is not constraining capacity growth, just its utilization. In contrast, increasing capacity utilization may indicate that capacity management is working.

The concept of capacity utilisation leads to the second important short run concept, excess capacity, which exists when the potential catch or effort level exceeds the actual catch or effort level in a given period. It will manifest itself in terms of capacity under-utilization.

Excess capacity might arise for a number of reasons. For instance, higher fuel costs might result in boats operating on average for fewer days than expected under more average conditions. Or fish stock recovery programmes might impose restrictions on catch or effort that lead to vessels being under-utilized during the recovery process, but allows the vessels to be fully utilized when the stocks have increased. In such circumstances, the existence of excess capacity would not be considered problematic to the fishery manager, although of course it may well be to the fishing companies.

Excess capacity may also indicate longer term problems in the fishery. If restrictions are imposed that limit catch or effort and these restrictions are likely to persist into the future, then excess capacity may be an indicator of overcapacity in the fishery.

In the long run, it is the concept of overcapacity which is important. This is because the concepts of capacity utilization and excess capacity relate to the existing condition of the resource. But in the longer term, some other level of the resource may be desirable, particularly if the stock is currently overexploited. Associated with this desired stock level would be a desired level of output that would represent the sustainable yield that could be attained, and a desired fleet size/configuration that would take this sustainable yield at lowest cost. These desired long run levels of output and fleet size can be considered as measures of *target capacity*.

A long-term output based measure of overcapacity would relate the potential output from the current fleet given the desired stock level to the target level, while an input based measure would relate the level of investment in the fishery now (in terms of boat numbers, GRT or some other unit) with the desired level of investment.

The target level of output will depend on the management objectives for the fishery. In some cases, maximum sustainable yield may be the target level of output while in others maximum economic yield may be more appropriate.

In summary, excess capacity and capacity utilization are short-term concepts that relate to the ability of the existing fleet to increase their output given current conditions. In contrast, overcapacity is a longer-term concept that indicates the extent to which the current fleet may need to be reduced in order to achieve a long run target level of output. It is important to note that the relationship between overcapacity and excess capacity is not straightforward. It is quite possible for overcapacity to exist even in the absence of excess capacity. Great care is needed therefore in the interpretation of capacity indicators.

V.2 Quantitative assessment methods

Problems of excess capacity and capacity under-utilisation can be assessed using a range of methods. The simplest of these is called peak-to-peak and as its name suggests compares current capacity usage with the peak production observed over a number of years. More sophisticated econometric techniques can also be used, notably Data Envelope Analysis and Stochastic Production Frontiers.

The most important issue however is overcapacity. A number of techniques exist also to estimate overcapacity but the most promising is bioeconomic modelling since this allows the estimate of capacity requirements at the target levels of output. Such modelling is likely to be of interest to managers for reasons other than capacity management and is therefore a worthwhile investment.

V.3. Indirect methods

Given the time necessary to develop quantitative capacity assessment methods, it is useful to consider indirect methods that can be used to give some indication of capacity.

Subjective measures of excess and overcapacity

One approach is to use expert knowledge, where assessments are based on the subjective assessment of individuals. This might involve fisheries scientists who have been associated with the fishery for several years, or may involve key industry members who are able to provide information on how the fishery has changed over time. For instance, fishers are likely to be in a good position to assess current capacity utilization by comparing their current activity levels to previous levels. Such approaches should only be used where other information is unavailable and the results must be used with caution.

Qualitative indicators of overcapacity

In the absence of quantitative indicators that are specific to capacity, other quantitative indicators related to the fishery may be used and interpreted to give a qualitative indication of the capacity situation and trends. No single indicator will be sufficient so a combination of indicators must be used and interpreted in accordance with the bioeconomic theory of fisheries exploitation in order to derive qualitative indicators of capacity.

Indicators which are typically used in a qualitative capacity assessment include:

- The biological status of the fishery

Stock assessments are undertaken with the aim of estimating stock abundance and the level of fishing mortality over recent years. Predictions of yield and biomass in the short term are often made, based on assumptions about continuing levels of fishing effort. Based on these assessments, advice is given to fisheries managers about target catch levels, based on a set of biological reference points (which may be explicit or implicit).

If the species in a directed fishery is considered to be overfished, then excess capacity almost certainly exists. Overfishing may also indicate overcapacity depending on management targets in the fishery and the reasons for the overfishing. If the problem is that adverse environmental conditions have caused temporary falls in stock levels, then there may not be overcapacity.

The interpretation is also complicated by the fact that most fisheries exploit more than one stock, so that capacity will have to be considered as some average of the individual stocks.

- The ratio of catch to TAC

Generally if catch consistently exceeds TAC, then the fishery has excess capacity. Once again the question of overcapacity requires assessment of the long-term management target and an appreciation of the reasons why the TAC is low compared to the catch.

This indicator requires very careful interpretation. Good control of the TAC will mean that catch cannot exceed TAC even if overcapacity exists.

The interpretation may be even more complicated if the catch consistently undershoots the TAC. A priori, this would imply that the industry does not have enough capacity, but managers need to be very careful that the TAC is correctly set compared to the long term target. A fishery where catch is below TAC is effectively operating with no control on fishing mortality (other than may be provided indirectly by other management measures).

- Fishing season length

Another capacity indicator related to the previous one is season length. If the TAC is exhausted before the natural end of the season then a priori evidence exists of excess capacity. The situation will be especially clear cut in situations where, as often seems to happen, the closed season becomes progressively longer over time.

- Conflict over TAC and quota allocations

The existence of conflict may be a simple indicator of excess capacity. If management proposals concerning TAC and quota allocations are accepted by the fishing industry without undue complaint then probably the capacity that they have is appropriate to the catch proposals. On the other hand, if the proposals generate serious levels of complaint and dialogue with the Ministry, then the indication is that the industry is facing an excess capacity problem.

- Increasing age of the fishing fleet

If the average age of the fleet is increasing, then this is probably an indication overcapacity. This is because increasing age means that there is a lack of new investment into the fishery, implying that profitability levels in the fishery are less than can be achieved elsewhere, which is an indicator of overcapitalization.

- Use of qualitative indicators

By their very nature qualitative indicators will not give an unequivocal picture of fishing capacity. Looking at the indicators above, it is quite possible for them to move in opposite directions at the same time. Analysts need therefore to use their knowledge of the fishery and their judgement based on theories of fisheries exploitation in order to reach conclusions concerning capacity from these indicators.

V.4 An initial assessment of capacity in Namibian fisheries

An initial qualitative assessment of Namibia's fisheries suggests that there may be some excess capacity in harvesting, and in processing, mainly due to short-term changes in fish stock size with possibly some over-investment arising from the rights-issuing process. However, given the catch history of the major fisheries and given current stock structure (certainly for hake, the most important single species, where current stock assessment suggests excellent recruitment in recent years with many juvenile fish), there are reasons to believe that catches will increase in the future. Hence overcapacity is probably not a major issue even if excess capacity may currently be a problem.

This tentative qualitative assessment needs to be verified by a more detailed qualitative assessment, and then backed up by quantitative estimates. Such estimates need to address in a comprehensive way the issue of overcapacity, and the best way to do this is to develop bioeconomic models of the fisheries.

Such models would be of great interest to policy makers in any case since they would enable the exploration of some key policy questions.

It should also be noted that, even if explicit assessments of fishing capacity have yet to be carried out, the level of capacity is implicitly monitored within the context of the process to set allowable catches and quota allocations. Within the context of this NPOA, such assessments will be undertaken explicitly.

No fisheries appear currently to be in need of urgent measures to deal with overcapacity, although some measures may be required to deal with excess capacity. The Ministry will pay attention to this problem in its development of fishery management plans.

VI. FISHERY MANAGEMENT PLANS

The Ministry is committed to a process of developing fishery management plans (FMPs) for the main fisheries. A draft plan exists for hake but this plan still requires a significant amount of work, and work has commenced on other plans.

The development of fishery management plans will be the responsibility of the Directorate of Policy, Planning and Economics with (substantial) input from the Directorate of Resource Management concerning the fishing possibilities offered by the resources and the implications of different possible exploitation strategies. This approach reflects that fact that fisheries management seeks to achieve social goals using the economic system subject to a resource constraint imposed by nature (in the form of the fish stock).

Capacity monitoring and control will be a key part of each FMP. Capacity objectives and plans will be determined on a fishery-by-fishery basis, in accordance with and as part of the fishery management plans as these are developed. Since overcapacity (as opposed to excess capacity) appears not to be a significant problem in Namibian fisheries, a key element will be to ensure that such capacity does not emerge in the future. To this end, an important part of capacity management plans will be to monitor the capacity implications of other policy measures and to advise the Minister appropriately.

Appropriate definitions of capacity will be developed for each fishery according to the nature of the harvesting and processing technology utilised. Using these definitions, the necessary data will be acquired and the technical tools developed so that capacity estimates may be made for each managed fishery. Calculations will be made concerning excess capacity and overcapacity, and policy recommendations will be made to the Minister. Where appropriate such recommendations might include capacity reduction targets as well as the management measures or approaches that are best suited to achieving them. Such targets and measures will be developed in close collaboration with industry groups.

Capacity reports will gradually be developed for the major fisheries and will eventually be prepared annually for each fishery. As fishery management plans are developed, the capacity reports will be incorporated into them.

VII. REGIONAL AND GLOBAL ISSUES

Namibia is a signatory to a number of international conventions, agreements and arrangements. In the context of this NPOA, and with particular reference to global and regional issues, the most important are:

- The Agreement for the Implementation of the Provisions of the UN Convention on the Law of the Sea of 10 December 1982 relating to the Conservation and Management of Fish Stocks and Highly Migratory Fish Stocks (the "UN Fish Stocks Agreement")

- The FAO Agreement to Promote Compliance with International Conservation and Management Measures by Fishing Vessels on the High Seas (the "Compliance Agreement")
- Ratification of the ICCAT Convention in 1999
- Ratification of the CCAMLR Convention in 1999
- Ratification of the SEAFO Convention in 2002

Namibia will co-operate, as appropriate and necessary, in the organization of assessments of fishing capacity at the regional level (within the relevant regional fisheries organizations or in collaboration with them).

Namibia will collaborate with FAO, as appropriate and as necessary, and with other international organisations and management bodies in the assessment of fishing capacity for transboundary, straddling, highly migratory and high seas fisheries.

Namibia supports FAO in the development of appropriate and compatible standards for records of fishing vessels.

Namibia has developed and maintains appropriate and compatible national records of fishing vessels, including those fishing on the High Seas.

VIII. LINKS BETWEEN CAPACITY ISSUES AND OTHER POLICY GOALS

Although Namibian fisheries do not appear to suffer from an important overcapacity problem, some capacity issues nevertheless arise. Inevitably, the capacity issue needs to be considered in the context of other policy goals being pursued by the Government.

VIII.1 Rights allocation and capacity

A first issue concerns the integration of fishing activities into the Namibian economy. In order to encourage such integration, the Government has explicitly linked rights allocations to companies' ability to demonstrate investment in the domestic fishing sector. It appears that this policy may have had an unintended side-effect of promoting some excessive capacity in both the catching and processing sectors, particularly in the hake fishery. The extent of any such problem remains to be investigated quantitatively in the context of bioeconomic modelling of the fishery.

In the interim, the Government will pay careful attention to the capacity-relevant incentives created as a side-effect of other policy measures. If it turns out that linking rights to fishing investment does give an inflationary twist to capacity, one solution would be to widen the definition of relevant investments. For instance, the Government might take into account investments in the Namibian economy in general rather than simply in the fishing sector when considering rights allocation. Such an approach would lessen the incentive to invest in unnecessary capacity in order to secure rights and at the same time would increase the impact of the fisheries sector on the wider Namibian economy. It would also help to achieve the objective set out by Article 6.3.3 of the Marine Resources Policy (rev 2004) wherein the

Government seeks to “create conditions that will increase the contribution of the marine resources sector to national income by encouraging reinvestment within Namibia”.

VIII.2 Capacity adjustment

A second issue concerns the non-malleability of fishing capital. Such non-malleability may have a number of features. Most important is the simple fact that it is not possible to go fishing with half a vessel. Another aspect is that it is difficult to do much else with a fishing vessel than fish. And thirdly, the market for fishing vessels tends to be somewhat thin, especially given the overcapacity that characterises some other countries' fisheries, so that selling a vessel may not always be an option. The upshot is that adjusting fishing capacity at the company level to available catch may be quite difficult in the short term.

The IPOA-Capacity does not deal with this issue, probably because for most countries overcapacity is such a serious issue that, unless it is dealt with, more esoteric issues like non-malleability are of limited relevance. However, because overcapacity is of relatively little importance in Namibia, issues of how to adjust capacity become far more relevant.

In Namibia the allocation of catch-based fishing rights has enabled fishing companies to avoid overcapacity problems, in line with economic theory. However, it has also meant that, compared to most other fishing nations, there are very few fishing vessels in Namibia and they tend to be relatively large.

A number of companies have only one vessel. Clearly such companies have no margin for capacity adjustment, either their vessel fishes or it does not.

The issue of non-malleable capital is of particular importance if fish stocks fluctuate unpredictably. In fact, unpredictable fluctuations in fish stock size complicate the interpretation of both excess capacity and overcapacity indicators. To avoid misunderstanding, in the case of such fisheries, Government will consult widely with industry before developing policy measures based on these indicators.

Dealing with non-malleability is a difficult challenge. One approach may be to reconsider vessel design and this is discussed in the next section. An alternative is for the fishing industry to charter some part of its capacity which acts a shock absorber as fish stocks fluctuate. Chartering raises a number of issues dealt with below. Other approaches will be investigated within the context of this plan.

VIII.3 Fleet design

The Namibian fishery management system is effective because it has enabled capacity to adjust to the available resources. In some fisheries, this has meant a decline in the number of vessels, in others it has meant chartering of extra capacity as that is needed. One effect of capacity adjustment is that there are relatively few vessels in the Namibian fishing fleet and they tend to be relatively large. They are also relatively old and, in some cases at least, relatively fuel inefficient. Quite probably over the next few years, the Namibian industry will

go through an investment cycle which will largely determine the nature of the industry for the next couple of decades.

Such investment cycles seem to be relatively common in fisheries around the world and they offer an opportunity to both the industry and the Government to reflect on the kind of capacity and the kind of industry that is appropriate. One point is that from a capacity perspective, smaller fishing vessels might enable more flexibility. In some countries, the maximum size of fishing vessels is regulated. (In the USA, for instance, the American Fisheries Act prohibits fishing vessels greater than 165 feet in registered length, more than 750 gross registered tons, or with engines capable of producing more than 3,000 shaft horsepower.) The Ministry will consider from time to time whether such a restriction is appropriate to Namibia.

It is neither the role nor the intention of the Ministry to tell the fishing industry which investments to make. Such investments will always be the responsibility of the fishing industry itself. However, the Ministry may affect investment decisions either directly by encouraging particular kinds of investment or indirectly as a consequence of the regulatory framework that it establishes. The Ministry needs therefore to understand how the industry will respond to regulatory changes in order to assess the extent to which the structure of fishing and processing capacity that emerges from investment decisions is appropriate to the other policy goals that the Ministry seeks to achieve.

Consequently, the Ministry will work together with Research and Industry to identify different possible capacity configurations of the fishing industry. One obvious need is to develop more fuel-efficient catching methods. This may simply require more modern versions of the same types of vessel, but it may also offer the opportunity for the development of different fishing methods altogether. It may imply a greater role for the use of static gears, or of other fuel-efficient technologies that remain to be identified.

Technologies will differ according to the type of fishery, so work on fleet design is best done as part of the fishery management planning process.

VIII.4 Evaluation of current management measures

Some management measures have a capacity impact even if they do not target capacity directly. In the future, the Ministry, together with Research, will evaluate the impact of these measures so as to eliminate, so far as is possible, unintended side-effects.

Such evaluations will be undertaken within the context of fishery management plans as these are developed for each fishery. An assessment will be made of the implications of different possible management measures for the kinds of capacity investments that will be needed in Namibian fisheries in the future.

This NPOA applies to all Namibian fisheries and the intention is gradually to develop fishery management plans for all fisheries. The remainder of this section discusses the case of the hake fishery to illustrate the way in which capacity issues interact with other management measures.

The hake fishery is based principally on two species: shallow-water Cape hake (*Merluccius capensis*) and deep-water hake (*Merluccius paradoxus*). The former are found in waters from 100m to 350m deep, and the latter in waters from 300m to 600m (TAC Report, 2006, p.12). In both cases, the populations are structured so that juveniles tend to be found in relatively shallow waters, moving further offshore as they age. The 200m isobath restriction means that only part of the *M. capensis* stock is available to fishing whereas all of the *M. paradoxus* stock is available. Perhaps as a consequence, landings predominantly comprise *M. paradoxus* (67% by weight and 73% by number – TAC Report 2006, p.23). But the hake biomass is apparently dominated by *M. capensis* (about 81% - TAC report 2006, p.9). These facts raise two interesting questions: (i) is *M. paradoxus* being overexploited compared to *M. capensis*? and (ii) can the two species be managed as two separate stocks within the hake FMP?

The answers to these questions are of clear policy significance. From the point of view of fishing capacity, a rather different catching structure may emerge if the two stocks can be managed independently than if they cannot.

An important element in determining the answers to these questions will depend on an evaluation of fishing restrictions within the 200-metre isobath. This management measure has been in place for a significant period of time. Its origin was to limit pilchard by-catches by the mid-water trawl fleet, but the measure was implemented as a general no-trawl zone in waters shallower than 200 metres.

The Ministry, with Research, will quantify the benefits of this measure and its costs, and will assess the extent to which the benefits can be achieved using other management measures.

Such an evaluation will be of particular interest in the development of the hake FMP and may have important implications for the future development of fishing capacity. A fishery targeting *M. capensis* and fishing somewhat closer to shore than present would appear to offer some economic advantages to Namibia. For instance, it is likely to be possible to use smaller vessels landing wetfish for onshore processing. If trips are shorter because the fishing grounds are closer, product quality and hence price may increase, and fishing costs (especially fuel costs) may be reduced. The balance of fishing effort and fishing mortality between the two stocks may also be improved, although the impact on catch of juveniles would need to be monitored closely (but this is in fact already done under current arrangements).

This discussion highlights the fact that fishing capacity has to be understood and addressed in economic as well as purely physical terms. The fishing industry responds to the economic signals that it perceives from the market (fish and input prices) and the regulatory framework within which it operates when making its investment and operating decisions. Given that the Namibian fishing industry appears likely to enter an investment cycle over the next few years, it is important that the appropriate economic signals are generated so that the investments made are desirable both from company and from national policy perspectives.

The basic IQ management system appears to be working very well and will be maintained. However, wherever possible, the Government will try to increase the flexibility offered by the system. In order to achieve such flexibility, it may be appropriate to review some aspects of the current system. For instance, there may be some scope to deal with by-catch issues by allowing some sale and purchase of quota, rather than only using deemed-value methods to discourage targeting.

From a purely capacity perspective, it may also be helpful if IQs could be determined earlier in the fishing season than is currently the case. One approach may be to allow early season fishing against a provisional quota which would be followed later by the definitive quota for the year. Allowing fishers to begin fishing earlier may reduce capacity requirements, but the full implications of such a change will have to be analysed.

VIII.5 Chartering

In itself, chartering can have very positive capacity effects. Companies can charter the capacity that they need as required and can easily reduce chartered capacity if fishing opportunities decline. For some fisheries (e.g. horse mackerel), chartering also offers access to fishing capacity that would otherwise be extremely expensive to put into place.

Despite its advantages, chartering also raises some policy issues. A principal difficulty is that the impact on the Namibian economy is likely to be rather smaller in the case of chartered vessels than in the case of Namibian-owned and Namibian-flagged vessels. For this reason, quota fees are higher in the case of chartered vessels.

As part of this plan of action, a strategy and policy towards chartering will be developed. One possibility would be to require rights holders to invest in some base Namibian capacity, which might then be "topped up" as needed by chartered capacity. However, the implications of this policy for newcomers' needs careful consideration since it may substantially increase the capital required to be able to participate in fishing.

The circumstances are likely to be quite different from one fishery to the next and a case-by-case approach will be adopted, once again within the context of the fishery management plans.

VIII.6 Processing

As established by section 3.4.3 of Namibia's Marine Resources Policy (August 2004), the Government seeks to encourage further investment in land-based fish processing with a view to increasing employment and overall earnings for Namibia. Such investment will be appraised, however, within the context of the general goal for Namibian fisheries policy which, expressed in Article 2 of the Marine Resources Act 2000, is that "policy with regard to the conservation and utilization of marine resources [will seek] to realize the greatest benefit for all Namibians both present and future".

Investment in land-based processing will be encouraged therefore only to the extent that it is consistent with the general policy goal. An audit of processing capacity will be carried out from time to time in collaboration with the fishing industry in order to determine current capacity levels and the opportunities available for future investments. If overcapacity is found to exist in the harvesting sector, any measures implemented to correct it will take into account the impact on the processing sector.

A more equitable solution may be found if processors are allocated rights (or privileges) to buy a portion of the available catch to process, in the same way that IQs represent a right (or privilege) for fishers to harvest a portion of the available catch. The Government will consider a system of Processor Shares in the specific case of capacity reduction in the harvesting sector, and will also assess their usefulness as a desirable permanent feature of the fishery management system, particularly to prevent the build-up of unnecessary processing capacity.

IX ACTIONS TO IMPLEMENT THE NPOA

Responsibility for the implementation of this NPOA lies with the Directorate of Policy, Planning and Economics (PPE) of the Ministry of Fisheries and Marine Resources.

The process of capacity assessment can be expressed as a series of questions:

- What is the current capacity?
- Is there excess capacity?
- If there is excess capacity, is it a problem? What are its causes?
- What level of capacity is required to meet the objectives of management?
- What does this mean in terms of fleet sizes, effort levels and capacity utilization, and processing capacity? What kind of fleet is optimal? What does this imply in terms of investment strategy?
- What management measures are required to move from the current situation to the desired situation?

In order to develop answers to these questions, Namibia will put into place a programme of work co-ordinated by the PPE Directorate that will aim to gradually improve understanding of the capacity situation of Namibian fisheries. The ultimate aim of this programme is to develop reliable capacity estimates and an effective management programme that will prevent overcapacity from undermining fishery management objectives; and to provide a sound basis on which to analyse the capacity implications of other management measures.

The programme of work will be reviewed annually. It will focus initially on the following aspects of the problem:

- The development of qualitative capacity indicators for the principal Namibian fisheries. Such indicators will include both the harvesting and processing sectors.
- The use of these qualitative indicators to undertake (together with the industry) assessments of the extent of excess- and over-capacity in these fisheries.
- Given the economic importance of the hake fishery to Namibia, work will begin to develop quantitative estimates of catching and processing capacity. Some work has already been undertaken to develop a bioeconomic model of this fishery. This work will be continued with the aim of developing a functional model that can inform the capacity issue as well as other dimensions of Namibian fisheries policy.
- Capacity issues will be brought explicitly into the Fishery Management Planning process.