OVERVIEW AND ANALYSIS OF SOCIAL, ECONOMIC AND FISHERIES INFORMATION TO PROMOTE ARTISANAL FISHERIES MANAGEMENT IN THE BCLME REGION - NAMIBIA

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FINAL REPORT AND RECOMMENDATIONS (NAMIBIA)

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Prepared by:
Dr Michael Batty and Martin Tjipute, Marine and Coastal Resources Research Centre, Henties Bay and Martin Shapi, Multidisciplinary Research and Consultancy Centre (MRCC), University of Namibia

With input from:
Dr Merle Sowman and Paula Cardoso, Environmental Evaluation Unit, University of Cape Town and Dr Peter Fielding, Fieldwork

EXECUTIVE SUMMARY

There is a widely held belief that Namibia has no marine artisanal fishery. Fisheries legislation provides for commercial fishing, dominated by a large-scale industrial fleet, and recreational fishing (from which the sale of catches is prohibited.) At the fringes of both these fisheries, however, there are a small number of individuals who operate in a way that would be described as artisanal elsewhere in the world.

Commercial fishing activities that display the characteristics of an artisanal fishery include a small beach-seine fishery for mullet; and a declining number of ski-boats using handline gear. In addition, fishermen operating from the shore (with or without recreational fishing permits) include a number of anglers, divers and gatherers who rely on their catches for food and income. Until recently the sale of their catches has been 'informal', but in 2003 one group of beach fishermen were granted an exploratory fishing right and now operate as an artisanal fishing association, with financial support from Government. Little is known about the socio-economic characteristics of the informal fishers nor their interest in gaining formal legal access to marine resources.

This artisanal fishery is tiny in comparison with the industrial and recreational fisheries, in terms of catches, employment and economic value. It is based partly on fisheries resources which support the recreational fishery.

In terms of fisheries information, the two main fish species caught by artisanal and recreational anglers have been researched in some detail during the mid 1990s. There is little information on other species of finfish and shellfish harvested, however, and although there are regulations in place for a number of species, their effectiveness in conserving the stocks is not systematically monitored due to the lesser importance of these fisheries combined with staffing and financial constraints.

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ABBREVIATIONS

BCLME – Benguela Coast Large Marine Ecosystem

EEZ – Exclusive Economic Zone

GDP – Gross Domestic Product

'HDI' – Human Development Index

HDI – Historically Disadvantaged Individual

MFMR – Ministry of Fisheries and Marine Resources

SADC – Southern African Development Community

WCRA – West Coast Recreation Area

1. INTRODUCTION

Namibia is located on the South West coast of Africa (refer Map 1). It is a sparsely populated country (2.2 million people), and with the exception of a few regions large parts of the country are classified as desert or semi-desert. The nature of its soils and climate thus make it unsuitable for arable agriculture. Its economy is largely dependent on fishing and mining and is not very diversified, as a result of inherited lack of differentiation and industrialisation during colonisation and its limited spectrum of known natural resources.

Nevertheless, Namibia's fisheries are one of the richest in the world, based on a productive eastern boundary upwelling system, the Benguela ecosystem (Lange, 2003) and are regarded by some as its "most important renewable natural resource, capable of sustaining an important part of the development endeavour of Namibia" (Manning, 2000).

The fact that the country was ruled by South Africa prior to 1990, meant that there was little control over the lucrative offshore fisheries because no country would acknowledge South Africa's jurisdiction of Namibia's 200nm Exclusive Economic Zone (EEZ.). As a result the fisheries operated as an open access resource, and consequently fish stocks were severely depleted (Lange, 2003). Following independence in 1970, the government embarked on a process of Namibianisation of the fishing industry. The key objectives of this policy were to grant access rights to Namibian operators, provide employment for Namibian nationals, especially those disadvantaged by discriminatory laws and policies, and promote export value added products. The extent to which the Namibianisation policies and processes have benefited historically disadvantaged poor coastal fishers has been questioned (Manning 2000, Erastus 2002). Clearly, the focus of these policies was on developing a sustainable industrial fishing sector. Little attention was given to developing and/or supporting a subsistence and/or artisanal fisheries sector as the general view amongst government officials was that there is no artisanal fishing sector in Namibia.

If one reviews the situation in other coastal countries, clearly marine subsistence/artisanal fisheries play a crucial role in the lives of, especially, poor coastal communities in terms of food security and livelihoods, providing income and informal employment. In addition to the above, these activities have social and cultural significance and value that are not easily measured. The literature suggests that many small-scale fisheries are often overlooked in fisheries development and management (Pacific Voice, 2003). This is so mainly because fisheries development policies, investment in research and regulatory efforts are focused

primarily on commercial fisheries and species perceived to be important in terms of their commercial value (ibid).

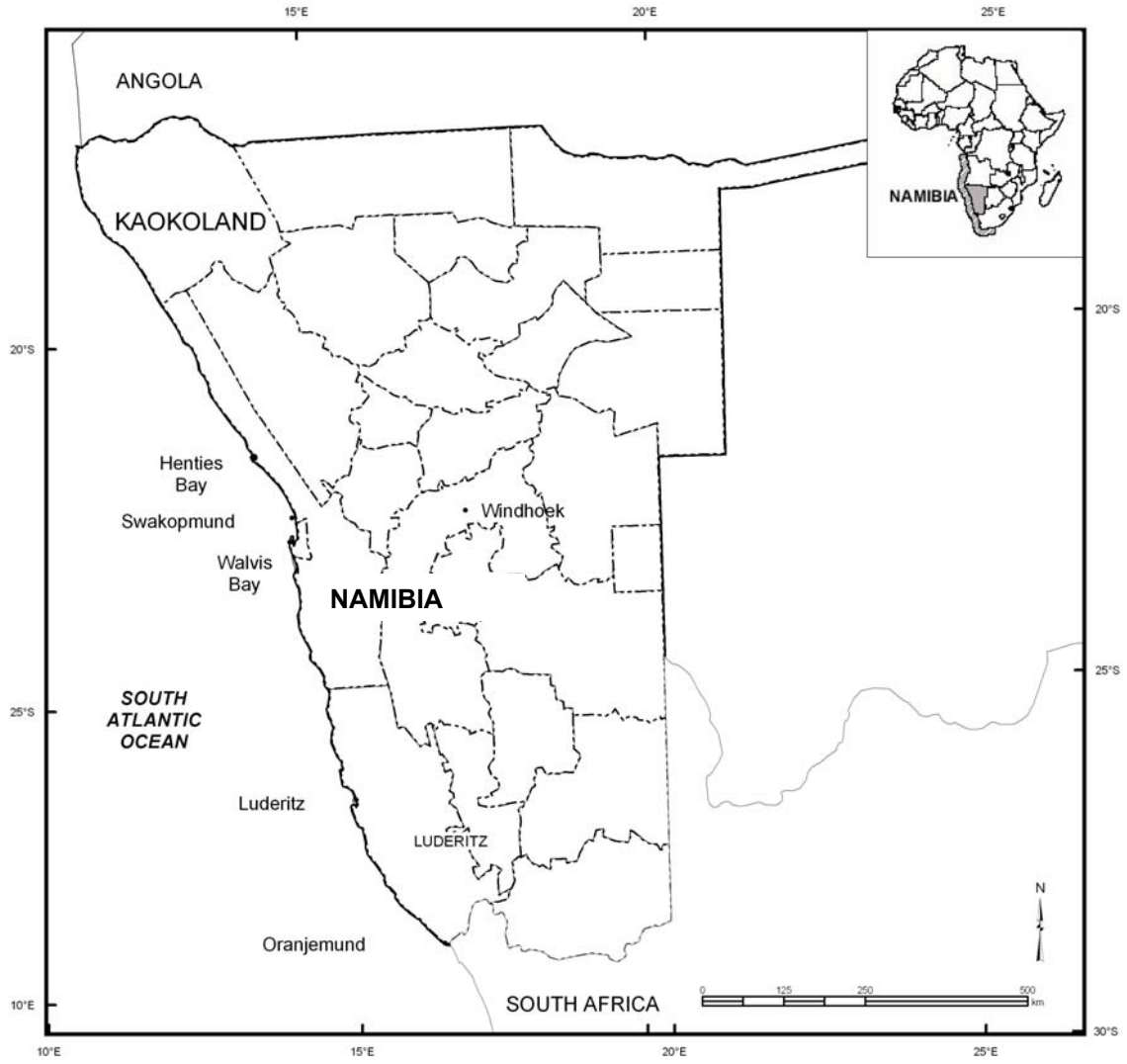

Figure 1: Map of Namibia

Special attention and where possible appropriate further development of the artisanal sector in the BCLME region is imperative to safeguard the livelihoods of these resource users and promote sustainable utilization of the resources in question. As will be seen below the Namibian legislation does not provide for artisanal fisheries in Namibia nor is the sector officially recognised by the government. Subsistence fishing is legislated for under the recreational sector. However there are some activities undertaken by poor coastal fishers that would in other countries be considered as artisanal.

2. OBJECTIVES OF THIS REPORT

The overall aim of this study LMR/AFSE/03/01/B is to undertake an overview and analysis of social, economic and fisheries information relevant to the marine artisanal fishing sector in Namibia, in order to contribute to the orderly management of artisanal fisheries in the BCLME region. Specific objectives are:

- To assess the adequacy, utility and appropriateness of current information in respect to artisanal fisheries so as to identify gaps,
- To determine information requirements and future research needs as well as related training needs.

This report is a synthesis of two reports: one written by Dr Michael Batty and Martin Tjiputi of the Marine and Coastal Resources Centre at Henties Bay, focusing on the scientific fisheries information and the other written by Martin Shapi from the Multi-disciplinary Research and Consultancy Centre at the University of Namibia, focusing on socio-economic information. Additional information has been provided by Paula Cardoso and Merle Sowman of the Environmental Evaluation Unit at the University of Cape Town. As will be seen below neither these authors nor government officials agree on which activities in Namibia could be classified as artisanal.

3. HISTORICAL BACKGROUND OF FISHING ACTIVITIES IN NAMIBIA

Evidence of human use of marine resources along the Namibian coast is found in the form of shell middens, some of them dating back to the early stone age more than 200,000 years ago (Namdeb, 2002). The use of marine resources – shellfish, seals, stranded whales and fish - by the Topnaar people, indigenous to the Kuiseb delta of the central Namibian coast, is documented by Kinahan (1991). The first Europeans to arrive in Namibia recorded resident and visiting populations at other ephemeral river mouths. It is reported that the Swakopmund area was named 'Otjozondjii' in the Herero language (meaning 'place of mussels'), for example (Anon, 2004).

From the 18th century onwards marine resources (e.g. whales, seals, fish, rock lobster, guano) were heavily exploited on a commercial basis by European, North American and later South African vessels. The European settlers initiated commercial fisheries, the earliest of which operated at Sandwich Harbour from 1851-1891. The heavy exploitation of

Namibia's marine resources repeatedly led to cycles of severe depletion of some resources (hake, anchovy and rock lobster) or the almost collapse of others such as whales and pilchard (Moorsom, 1984).

In the late 1960s, the South East Atlantic became the focus of international fishing fleets, and a massive expansion of industrial fishing occurred based mainly at the port of Walvis Bay. This also created opportunities for smaller scale fishing activities. Small boats using handlines and set-nets operated in inshore areas (Holtzhausen, 1999), through to the 1980s.

In keeping with colonial policies, the indigenous peoples of Namibia were excluded from gaining access rights to harvest marine resources. Thus by 1983 the inshore-based fishing industry was mostly in the hands of a cartel of six white South African fishing companies (who dominated the pelagic fishery, were holders of lobster quotas, meal and oil producers, and pilchard canners) and a few white Namibians (Moorsom, 1984). The offshore based fishing (hake and mackerel) industry was dominated by fleets from Spain, the USSR, other Eastern European countries and Japan (Moorsom, 1984, Manning, 2000), which did not have bases in Namibia.

During the 1970s, recreational fishing also developed rapidly, with the provision of a permanent road along the coast north of Swakopmund, government-run campsites were established at some of the favoured fishing spots and the opening of the fishing resort of Terrace Bay in the Skeleton Coast Park. In the 1990s, the newly elected Government of an independent Namibia took over responsibility for the management of these fisheries.

After independence the Government moved quickly to promote the Namibianisation of the fishing industry. It excluded foreign vessels from the newly declared EEZ, put in place stock-rebuilding strategies and ensured Namibian participation in the fishing sector. This policy has seen major growth in Namibian shareholding and employment in the sector which has remained predominantly industrial.

4. POLICY AND LEGAL CONTEXT

4.1 THE 1991 WHITE PAPER "TOWARDS RESPONSIBLE DEVELOPMENT OF THE FISHERIES SECTOR"

In terms of policy formulation relevant to fisheries management in Namibia, the Ministry of Fisheries and Marine Resources soon after independence issued the 1991 White Paper "Towards Responsible Development of the Fisheries Sector". It had two main objectives: 1) to prevent depletion of species and rebuild stocks decimated during the colonial period and 2) to maximise benefits for Namibians, both the harvesting of fish and in the processing industry. This policy is currently under review and has been renamed "Towards Responsible Development and Management of the Marine Resources Sector".

In this policy the mission of the Ministry is to strengthen Namibia's position as a leading fishing nation and contribute towards the achievement of the country's economic, social and conservation goals for the benefit of all Namibians. To achieve the above mission the ministry has several specific objectives. These are as follows:

- Promote and regulate the optimal sustainable utilization of living marine resources within the context of conserving marine ecosystems;
- Establish a conducive environment in which the fishing industry can prosper and derive optimal income from marine resources;
- Further Namibia's interest within the international fishing community;
- Provide professional, responsive and customer focused services;
- Continuous investing in human resources development;
- Establish a conducive environment for the conservation, utilization and management of living marine resources and fresh water fish resources; and
- Develop a conducive environment for the responsible and sustainable development of aquaculture.

4.2 MARINE RESOURCE ACT NO. 27 OF 2000 AND THE REGULATIONS RELATING TO THE EXPLOITATION OF MARINE RESOURCES (2001)

This Act was enacted by Parliament in 2000 and enforced on August 1, 2001. The Act replaced the Sea Fisheries Act of 1992, and deals with the harvesting and commercial exploitation of marine fisheries resources. The Regulations Relating to the Exploitation of Marine Resources (2001) promulgated under this act replaced the Sea Regulations of 1993. One vital feature under this piece of legislation was the establishment of a permit system for recreational fishing as a measure to protect and conserve coastal fish species.

The introduction of this regulation resulted in the Ministry issuing 14, 313 permits generating some N$ 297,402 in the form of State revenue in the first month. Of those permits, 12, 383 were issued to Namibians while 1930 were issued to non-Namibians.

These laws identify only two types of fishing: commercial and recreational. Artisanal and /or subsistence fishing is not defined or specifically provided for. However in terms of the definitions ", 'recreational purposes' means for the purpose of sport, leisure or subsistence" (MFMR, 2001 – Regulations Relating to the Exploitation of Marine Resources, Part I - Definitions).

Commercial fishing includes all fishing activities from which the catches may be sold, and which require a right or exploratory right, and may be subject to restrictions on quotas, gear, methods, season and so on. In the MRA harvesting of marine resources for 'commercial purposes' includes amongst others, "the intention of selling, bartering, pledging or otherwise disposing of, or delivering or offering to do any of these things mentioned in this paragraph in respect of such resources" and "exceeding the limits prescribed for the harvesting of marine resources for own use" (MRA, 1992 – Part I, Definitions)

Commercial fishing rights are issued almost exclusively to Namibian companies by the Minister of Fisheries. Applications are screened by a high level committee within the Ministry which considers, *inter alia*, the shareholding of the company, its record in the fishery if any, projected employment and other economic benefits. Only right-holders are entitled to participate in a fishery, and in the major fisheries are allocated a proportion of the Total Allowable Catch. There are nominal application and vessel licensing fees, but charges are mainly levied on the catch with fixed fees per tonne. Depending on the fishery, these may include a quota levy, a by-catch levy, an observer fund levy and a scientific research levy. The resources targeted by the fishers whose activities could be described as artisanal, are subject to some of the lowest levies in Namibia, with $25 per tonne payable on linefish landings and $2.50 per tonne for mullet.

Recreational fishing involves activities from which the sale of catches is prohibited, requires an individual permit, and for most commonly taken species is subject to restrictions on daily catch, size limits and fishing methods (hook and line, and a scoop net to lift rock lobsters from the water once they have been reeled to the surface; a ring net or diving- section 6 of the Regulations).

Recreational fishing permits are issued to any applicant – irrespective of residence or nationality - on production of an identity document and payment of a fee of NA$14 for a one-month license or NA$168 for a year. Licenses can be obtained at MFMR offices in Luderitz, Walvis Bay, Swakopmund, Henties Bay and Windhoek. There is no limit on the number of licenses issued.

As already highlighted above, the definition of 'recreational purposes' includes subsistence usage. Within the regulations dealing with recreational fishing, there are provisions made for persons without fishing permits (section 8.5) to harvest and retain some resources (aquatic plants, molluscs and seashells –see Box 1) for his or her own use.

Box 1: Marine Resources Regulations indicates quantity or mass of marine resources that may be harvested without a fishing permit *(Annexure K - MFMR, 2001, Regulations Relating to the Exploitation of Marine Resources)*

a) 1 kg of aquatic plants, other than brown seaweed;
b) 50 black mussels;
c) 2.5 kg dry weight or 10 kg wet weight of brown seaweed;
d) 15 limpets;
e) 5 molluscs, other than black mussel, limpet, periwinkle or white mussel;
f) 25 periwinkles;
g) 10 kg of sea shells;
h) 25 white mussels; and
i) 10 mud prawns of the species U*pogebia africana or Upogebia capensis*.

4.3 AQUACULTURE POLICY 2001

The Government of Namibia views aquaculture development as a priority area. The current policy of this developing sector is laid down out in the policy paper *"Towards the responsible Development of Aquaculture (2001).* Marine species like shellfish and finfish and fresh water species like Tilapia (*Oreochromis andersonii)* and catfish *(Clarias gariepinus)* were identified as having potential for aquaculture. Fresh water aquaculture pilot studies are underway in the northern region (Kavango, Caprivi and Omusati) and Hardap region. The main policy objective is the responsible and sustainable development of aquaculture to achieve socio-economic benefits for all Namibians whilst ensuring environmental stability.

The Government foresees that the role of aquaculture is to enhance food security, reduce poverty, create employment, improve rural livelihoods and increase investment. Specific

objectives of aquaculture are to promote aquaculture activities in and around the productive unpolluted and nutrient rich waters off the coast of Namibia and the four perennial rivers that border Namibia.

4.4 NAMIBIANISATION

Policies and legislation adopted by government after independence must be seen in the context of the Namibian Constitution, which states that:

> "*The state shall actively promote and maintain the welfare of the people by adopting, inter-alia, policies aimed at the following:*
> *… j) consistent planning to raise and maintain an acceptable level of nutrition and standard of living of the Namibia people and to improve public health;* ….
> … l) *maintenance of ecosystems, essential ecological processes and biological diversity are maintained and living natural resources are utilised on a sustainable basis for the benefit of Namibians, both present and future"* (Article 95 – Promotion of the Welfare of the People).
>
> *"Land, water and natural resources below and above the surface of the land and in the continental shelf and within the territorial waters and the exclusive economic zone of Namibia shall belong to the state if they are otherwise lawfully owned" (*Article 100 - Sovereign Ownership of Natural Resources).

The Namibianisation of the fishing industry intended to benefit those Namibians who had 'been socially, economically or educationally disadvantaged by discriminatory laws or practices' in the past. To achieve this, the government used the granting of rights of exploitation and the allocation of quotas to Namibian operators. By 1994 it is claimed that 70% of right holders were 'wholly owned Namibian businesses' and '23% were majority Namibian owned' (Manning 2000, p. 28, quoting Kankodi 1994).

The 1991 White Paper "Towards Responsible Development of the Fisheries Sector" can thus be seen as part of the Namibianisation of the fishing industry, in promoting employment of Namibians in fishing and processing as well as in associated support and service industries (e.g. boat building, gear production and repairs, can making, distribution and marketing) and in also seeking to export value added products (Manning, 2000).

According to Manning (2000) the declaration of an Exclusive Economic Zone (EEZ) and thus of vastly expanded fishing grounds also provided the opportunity for the Namibian

government to use fisheries for redistributive purposes to address the large socio-economic inequities inherited from apartheid-rule. This would allow government to use the developmental potential of fisheries to give impetus to other government policies in which poverty alleviation was identified as a national objective[1].

Manning (2000) states that government policy on investment (e.g. reduction of non-mining corporate tax rates to 35% and of non-resident shareholder tax to 10%; exemptions from exchange controls to enable repatriation of profits and capital) can also be seen as a measure that, by attempting to attract foreign direct investment through a range of incentives, tried to encourage manufacturing, exporting and job creation in different industries in Namibia, including the fishing industry.

In assessing the outcome of the new fisheries policy in Namibia, Manning (2000) and Erastus (2002) have reservations regarding its success with respect to the socio-economic benefits accrued to those Namibians who were mostly disadvantaged in the past. Manning (2000) for instance states that 'Namibia has done extremely well in managing the fisheries sector since independence' and that 'the Government deserves the considerable praise that it has received for its stewardship of Namibia's marine fisheries' (p. 1). However, he also expresses concern that those who have benefited are the more wealthy and educated Namibians, with few benefits accruing to the most marginalized. He argues that while the poor would not have had the capacity to harvest marine resources, the Namibianisation of the fisheries should have ensured that part of the benefits, in terms of 'resource rents' [2] (or profits in excess of normal profits) were directed to the poorest.

He states that just after independence the government was collecting more than 50% of available rent, but that this dropped to 26% in 1997 and 11% in 1998, resulting in N$723 million in uncollected rent (Manning 2000). This has been accruing to the private sector, not only to Namibians who have joined the fisheries industry since independence, but to large (Namibian and foreign) conglomerates.

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[1] Manning (2000, p. 8) lists the following: 1- "The 1991-1994 Transitional National Development Plan specifically identifies objectives for the fishing industry as reviving and sustaining economic growth creating employment opportunities, alleviating poverty and reducing income inequalities"; 2- The First National Development Plan (Namibia 1994) that "highlighted poverty reduction as a national objective. It set a target of reducing the percentages of relatively poor households from 47% to 40% and extremely poor households from 13% to 7% by the year 2000"; 3- The Poverty Reduction Strategy for Namibia of 1998, which provides 'a framework, shared by ministries and other stakeholders, within which efforts at poverty reduction can proceed".

[2] A concept in economics " that relates the scarcity of a natural resource to the demand for it. It may be defined as revenue in excess of costs, when costs include a return to capital and labour, to risk and to entrepreneurship", ie "refers to what is in excess of 'normal' profits" (Manning 2000, p. 11)

5. DEFINITION OF ARTISANAL FISHING

Information from both the Government of Namibia (Ministry of Fisheries and Marine Resources) and a review of the available literature on Namibian fisheries indicates that there are no formally recognized marine artisanal fisheries in Namibia.

In the wider literature the SADC marine fisheries profile for Namibia, for example, states that "the absence of traditional artisanal fisheries is due to several factors, including: a long desert shore without human settlements, rough seas and extended hypo-oxygenated areas close to the coastline." A search of Aquatic Science and Fisheries Abstracts from 1988 to 2003 also returns no references to Namibian artisanal fisheries. Data available, including internet searches only represent the inland/fresh water artisanal fisheries in Northern Namibia (Abbott *et al* 2003, Purvis 2002a; Purvis 2002b and 2002).

Batty and Tjiputi (2004) on the other hand look at the literature review carried out by Hauck (2000) on artisanal and subsistence fishers with a view to establishing a definition in the South African context. She records that there is no standard definition that applies internationally, but that artisanal fisheries typically combine some or all of the following features:

- Small scale;
- Privately owned and operated;
- Low technology;
- Limited fishing range; and
- Catches often used partly for subsistence.

The term is also often used in developing countries where governments are encouraging fishers, who had not previously sold their catches, to enter the cash economy. According to Batty and Tjiputi (2004) this exactly describes the Hanganeni fishing association in Henties Bay. They further argue that other fishing activities in Namibia (the beach seine fishery in Walvis Bay, the ski boat fishery in Walvis Bay and Swakopmund, and a variety of informal activities) also meet all of these criteria and can therefore be classed as artisanal. Their report describes the fisheries concerned, and summarises information available on the resources that they exploit.

Shapi (2004) states that the director of *Policy Planning and Economics* in the Namibian Ministry of Fisheries and Marine Resources for instance, claims that the following factors contributed to the absence of (a recognized) artisanal fisheries in Namibia:

- "Artisanal fisheries require cheap/traditional gear such as boats etc., but such gear can not be used in our rough sea.
- The fact that the country has well-established commercial fisheries means that it is difficult for the artisanal fishers to survive the competition.
- It has to do with historic policies and practices that black people were not allowed access to the sea and its resources hence a fishing tradition was not embedded in the community. The black people were only allowed to work in the factories but not to fish for themselves".

In addition, Uulenga and Ambambi (deputy director of Policy Planning and Economics and deputy director of Technical Services, respectively, in the Walvis Bay office) claim that there are no artisanal fisheries in Namibia because there is no coastal community whose livelihood depends on fisheries, as is the case in Angola and Tanzania. They argue that due to the coastal desert, coastal communities along the sea are only found in towns and that these communities never lived only from fish for their livelihood. The MFMR also feels strongly that there is no illegal fishing along the coast. They contend that illegal fishing was done away with immediately after independence. The current situation is that people apply for recreational fishing permits, which cost N$ 16.00 and last for the period of one month. This permit can be used anywhere long the Namibian coast. These types of fishers are called anglers, not artisanal fishers, according to the Ministry. They are called anglers because they are not allowed to sell their catches (Ambabi pers comm).

There is thus a lack of consensus not only on the understanding of what characterises artisanal fishing but on whether or not artisanal fishers operate in Namibia. Given the historical evidence for pre-colonial fishing activities along the coast and the fact that artisanal fishers' livelihoods usually do not depend only on fisheries but on a variety of combined strategies, the activities described by Batty and Tjiputi (2004) as exhibiting artisanal features, will be included in this report.

6. THE SOCIO-ECONOMIC CONTEXT

Namibia is designated as a medium human development country, with a human development index (HDI) of 0.627 in 2001. In terms of its HDI, it ranks 124 out of a total of

175 countries in the UNDP Human Development Report for 2003. Despite some gains in health and education in the previous 10 years (Table 1) this HDI value indicates a slight decline from 1995, when it was 0.677. Trends in income inequality are not available but data for 1993 (Table 2) shows that Namibia has high levels of inequality as reflected in Table 2, in the Gini Index of 70,7 (even higher than the one in South Africa, at 59.3) and in the following statement : "7 000 Namibians were estimated to spend as much as the poorest 800 000 combined" (Manning 2000, p. 8, quoting the National Planning Committee 1996, based on the 1993/4 Namibia Household Income and Expenditure Survey).

Table 1: Some trends in health and education indicators for Namibia

Table 1 a)

	Under 5 mortality rate (per 1,000 live births)		**Infant Mortality rate (per 1,000 live births)**		**Maternal mortality ratio (per 100,000 live births)**	**Undernourished people (as % of total population)**	
	1990	**2001**	**1990**	**2001**	**1995**	**1990/92**	**1998/2000**
Namibia	84	67	65	55	370	15	9
Medium HDI countries	82	61	58	46	286	19	15

Table 1b)

	Net primary school enrolment ratio (%)		**Children reaching grade 5 (%)**		**Youth literacy rate (% age 15-24)**		**Adult literacy rate (% age 15 and above)**	
	1990-1991	**2000-2001**	**1990-1991**	**1999-2000**	**1990**	**2001**	**1990**	**2001**
Namibia	89	82	63	92	87.4	91.9	74.9	82.7
Other Medium HDI countries	86	88	n/a	n/a	84.5	87.8	71.8	78.1

Table 2: Income inequality in Namibia

	Share of income or consumption (%) *				**Gini index ***
	Poorest 10%	**Poorest 20%**	**Richest 20%**	**Richest 10%**	
Namibia #	0.5	1.4	78.7	64.5	70.7

*Source: UNDP Human Development Report, 2003, p. 200, 202, 210, 272, 273, 284; # Survey based on income, 1993; *Not available for Namibia in UNDP Human Development Report 2002 for comparison purposes.*

6.1 THE COASTAL AREAS

Along the coast the main economic activities are fishing, diamond mining, tourism and oil/gas exploration. Human settlement is limited and according to Tapscott (1999) the coastal population in 1999 was estimated at 100,000 or 6.5% of national population and confined to four main centres, namely Swakopmund (associated with the tourism), Walvis Bay (associated with the fisheries sector) Luderitz (associated with fisheries and diamond mining) and Oranjemund (associated with diamond mining) and a smaller settlement in Henties Bay (associated with fishing).

There is very limited documented socio-economic data on fishers involved in subsistence and artisanal (as defined in this study) fishing activities along the coast of Namibia. However a brief description of two of the coastal centres associated with “artisanal” fisheries (Henties Bay and Walvis Bay) is presented when the fisheries in these areas are described in section 7.

6.2 ECONOMIC CONTRIBUTION OF FISHING

Since independence the fishery sector has played a major role in the Namibian economy. Its total contribution (fishing and fish processing) towards GDP has increased steadily (e.g. from 8.7% in 1995 to 10% in 1999, Erastus, 2002). Employment in the fishing industry has also increased (Table 3). Fishing is also a major source of exports, Erastus (2002 –quoting Financial Times, 14 September 2001) stating that it amounts to 28% of total export earnings.

According to Erastus 43% of workers in the fishing industry are employed off-shore, while the on-shore processing sector accounts for 57% of employment. This includes fishmeal and fish oil production, skinning, cut filleting, trimming, cutting and packaging, which is mostly carried out by women, although they also engage in the harvesting of oysters and seaweed farming (Erastus, 2002).

Table 3: Employment in the formal fishing sector (at sea and on land) in Namibia

Year	Namibian	Non-Namibian	Total
1991	5 999	5 076	11 075
1992	7 091	5 411	12 502
1993	9 303	5 543	14 846
1994	10 146	4 426	14 572
1995	8 9432	4 388	13 331
1996	6 906	4 019	10 935
1997	9 684	3 916	13 600
1998	12 272	3 810	16 082

Source: Erastus, 2002, Table 6, quoting Ministry of Fisheries and Marine Resources, 1998

In their report Batty and Tjiputi (2004) provide key indicators of the economic value of the artisanal fishery and contrast it with the industrial and recreational sectors (Table 4). Note that the estimate for the recreational fishery is the most dated, and that due to currency movements the Na$ expenditure on this fishery may be expected to have increased significantly in recent years.

Although the data are not exactly comparable, it is clear that the artisanal fishery is many orders of magnitude smaller in economic importance than the industrial fishery, and very small compared to the recreational sector. Even in terms of employment/participation, where artisanal fisheries normally score highly, it is much less important than the other two sectors.

Table 4: Estimated economic value of different fisheries sectors

Fishery	Participation No.	Catch, tonnes	Turnover Na$
Industrial (Data for 2002, Barnard 2003)	14,000 full time employees	625,000 t.	$2.6 billion exports (over 90% of catches exported)
Recreational (Kirchner, 1998 for 1996/ 1997)	8,800 anglers fishing 173,000 days	Approx 500 t.	$30 million aggregated expenditure
Artisanal (Estimated above for 2003)	Less than 200, many part-time	Less than 150 t.	Approx. $1million sales

The estimated number of artisanal fishers given above is questioned by some government representatives (Shapi 2004). Figures from the SADC Fisheries profile for Namibia (2002) as well as from the Ministry of Fisheries and Marine Resources in fact regard the contribution of the artisanal fishery sector towards employment creation to be zero (Table 5).

Table 5: Contribution of artisanal fishery sector towards employment creation

	Years	**1995**	**1996**	**1997**	**1998**	**1999**
Employment in:						
Industrial Fisheries		15,600	15,020	14,538	14,125	14,500
Artisanal Fisheries		0	0	0	-	-

Source: SADC Fisheries resources Namibia, 2002

7. NATURE AND EXTENT OF ARTISANAL FISHING ACTIVITIES

7.1 FISHING RIGHT HOLDERS

The following three fishing activities licensed as commercial operations are considered by Batty and Tjiputi to meet the criteria for artisanal fishing: the Hanganeni Fishers Association in Henties Bay; the Beach Seine fishery for mullet in Walvis Bay; and the Skiboat fishery based in Swakopmund and Walvis Bay. However, Shapi's report considers that only the Hanganeni Association is considered to meet most of the criteria for artisanal fisheries because it is a community of fishers that depend on fishing for their livelihood. According to Ambabi (in Shapi) the Beach Seine Fishery should not be regarded as artisanal as some of their fishery activities do not meet artisanal fisheries criteria, as most of the Beach Seine owners are involved in other economic activities or have other sources of income and rely on fishing as an additional source of income, whereas in his view artisanal fishers are entirely dependent on their daily fishing for living.

7.1.1 The Hanganeni Association in Henties bay

The socio-economic profile of Henties Bay

Henties Bay is one of the small towns in the Erongo region, which has an estimated population of 120,800 people (Erongo Regional Development Plan 2001/2002 –

2005/2006). The Henties Bay population fluctuates between 2,700 and 3000 people. The permanent residents number 2,700 while the population rises to 3,000 during the high season (over holidays) (Henties Bay Municipality 2004).

There are few employment opportunities in the town. There is one brick making factory and over ten accommodation establishments (Bed and Breakfast, mostly) (Henties Bay Municipality electronic. comm.). The Henties Bay employment rate is estimated at +/-40%, which translates into a large percentage (approximately 60%) of the population being unemployed.

In terms of social services, Henties Bay has one (1) state primary school, one (1) private school, two (2) pre-primary schools, one (1) state clinic, one (1) private doctor and one (1) dentist (Henties Bay municipality electronic comm).

The average size per household is 4.5 in the Erogo region which is lower than the national figure of 5.7 persons per household (Erongo Regional Development Plan 2001/2002 – 2005/2006). The main source of income in this region is from employment in the fishing industries and tourism. The farming potential is not promising due to limited rainfall and poor soils.

The Hanganeni Association

History: Before independence the people of Henties Bay used to harvest fish for their livelihood, using prohibited bait. After independence and with the introduction of new laws to control illegal fishing, unemployed fishers lobbied the government to be allowed to continue to practice their fishing tradition. In response, the Ministry of Fisheries and Marine Resources told the fishers to organize themselves into an association so that they could acquire fishing rights. Young unemployed Namibians from Henties Bay formed the Hanganeni Association with the assistance of the Ministry of Fisheries and Marine Resources (Uulenga and Ambambi pers. comm.).

Substantial donor funding, mainly from the Government of Spain was obtained and this enabled the Association to construct a large fish processing facility, purchase two vehicles and other equipment, while the Ministry of Fisheries and Marine Resources provided working capital. From the government's perspective, this was one way of creating employment for the unemployed people of Henties Bay (Ambambi pers. comm). This is the first community fisheries project the government has initiated. Henties Bay was chosen on the basis that the population was growing and employment opportunities were limited. The

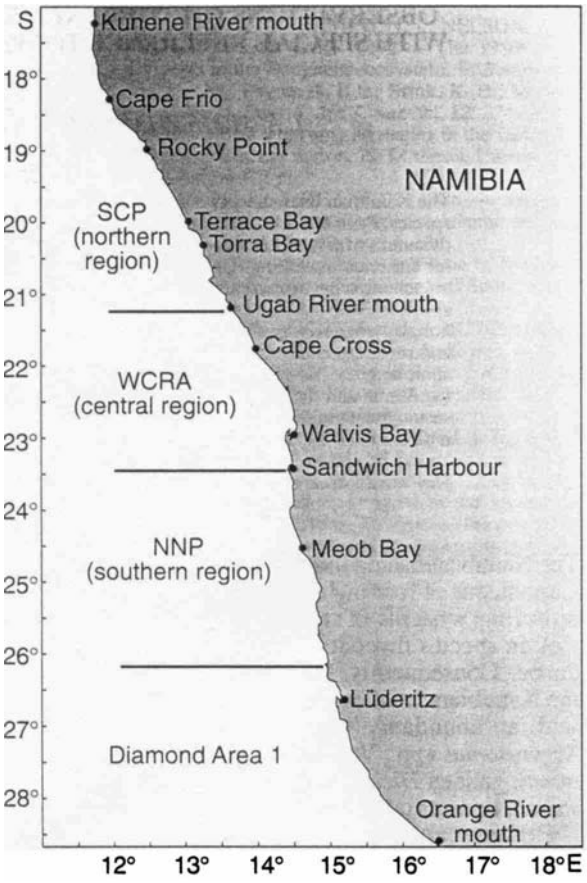
Henties Bay Municipality also assisted the project by providing land to the Association, partly as a response to the high unemployment and crime rates in the town.

Membership: For one to be a member of the Hanganeni Association one has to be a resident of Henties Bay and have lived there for more than two (2) years (Imbamba electronic. comm). Ambambi (2004) indicated that there are no educational requirements attached to membership and the age composition varies, estimating that the eldest member of the association was approximately 54 years of age.

According to Shapi there are 31 association members (Batty and Tjiputi say that there are 40), of whom 22 are fishers, who fish from the beach throughout the year using rod and line. The other 9 members 2 are drivers, 5 processors, 1 assistant administrator and 1 manager. In terms of gender representation, there are 11 women in the association. Of the 11 women, 5 are processors, 5 are fisherwomen and 1 is the manager. The processors were trained but some of them had previous experience in how to clean fish.

Transport, fishing grounds and market: The Association has two vehicles to transport the fishers to different fishing areas. Fishers operate throughout the West Coast Recreational Area (WCRA), but the main fishing area is north of Henties Bay as far as the Ugab River, particularly at Mile 72 about 50 Km north of the town (see Figure 2).

Figure 2: Map of Namibian Coast showing fishing locations



Map of the Namibian coast showing locations mentioned in the text.

Note that Diamond Area 1, the Namib Naukluft Park (NNP) and the Skeleton Coast Park (SCP) are not open to access by beach fishers, who concentrate on the West Coast Recreation Area (WCRA). Only the guests at the resort at Terrace Bay, and the campsite at Torra Bay open in December and January, are allowed to fish in a small part of the SCP. More than two thirds of the 1,500 km coastline is thus closed to fishing from the shore.

Source: from Holtzhausen et al., 2001

The market for the Hanganeni Association is mainly local but includes some inland Namibian towns. Members sell their fish in the restaurants and hotels in the towns of Henties Bay, Swakopmund, Walvis Bay, Okahandja and Windhoek. The Association also sells its fish in the northern regions of Namibia, formally known as Ovamboland (Ambabi and Imbamba pers. and electronic comm).

Catches and target species: In 2003, their first full year of operation, Hanganeni recorded a total catch of 7.5 tonnes of fish, with a sale value of $135,000 (*unpublished association records*). Catches are predominantly Steenbras (*Lithognathus aureti)* and Kob *(Argyrosomus inodorus* and *A. coronus),* but Galjoen (*Dichistius capensis)* and Blacktail (*Diplodus sargus capensis)* are also caught in smaller quantities and sold. In mid-2004, the Association was informed by MFMR that the sale of Galjoen would no longer be permitted. This is in line with a long-standing view that Galjoen should not be treated as a commercial species. Other species landed such as Barbel (*Galeichthys feliceps)* are not sold, but may be used by the fishermen for their own consumption (Imbamba, pers. comm.).

The sustainability of the Hanganeni Association: In terms of the sustainability of the project, the fishers at present are making a living from the project and the project could be viable (Ambabi pers. comm) in the long term. However, the funds from the Government of Spain came to an end at the end of 2003 and the project needs more support. The Ministry of Fisheries and Marine Resources has so far continued to support the Association by providing funds to cover operational costs (water and electricity) and buy fishing equipment, while the Association pays for other expenditures including salaries from its own generated income. But the Ministry's support to the association is also due to end.

Members are paid based on the monthly income of the association. Fishers are paid on a quota basis (according to the amount of fish they catch), while the processors and administration staff get fixed percentages of the association's monthly income. The association's income and sustainability is thus dependent on catching enough fish. The Hanganeni Association are concerned about the long-term sustainability of their operation and have requested that the government provide them with a ski-boat. The Ministry is currently considering this request. According to the manager, if assistance with the ski boat and with the jetty is realised, than the association could be self sustaining in the long term.

7.1.2 The Beach Seine Fishery of Walvis Bay and Luderitz

Walvis Bay is the largest coastal town of Namibia with an estimated population of 53,000 (Stewart 2004 pers comm, Tapscott, 1999). Available statistics, suggest that the population is growing at the rate of 5.35% per annum and that this increase is largely based on immigration into the town, as estimates based on births and deaths suggest a very low rate of natural increase of 0.1% per annum (Tapscott, 1999). The growth rate of the town fluctuates annually, as a function of both limited work opportunities elsewhere in the country and the perceived availability of employment in Walvis Bay, especially in the fishing industries and tourism sector (Walvis Bay Municipality, Tapscott, 1999).

The recent Municipal survey on community needs assessment indicates that 20.9% of the heads of households are from the town, 45.6% from rural areas, 32.7% from other areas in Namibia and 0.9% from outside Namibia (Municipality of Walvis Bay, 2004). These and other statistics illustrate the fact that Walvis Bay is very much a town of migrant workers, some of whom settle permanently and others of whom retain a base in the rural areas (Tapscott, 1999).

Municipal statistics revealed that 67% of the town's population is employed compared to 63.3% in 1997 (Walvis Bay Municipality, 2004; Tapscott, 1999). In 1997, 15.7% were unemployed and 21% were classified as economically inactive; unemployment rates were higher among women (20.1%) than among men (12.7%) in 1997. Equivalent data is not available in the 2004 survey.

Of the 67% employed, approximately 52% are employed in the formal sector, 5% in the informal sector and 3% regard themselves as self employed. Approximately 7% are employed on a casual basis.

Luderitz is the third largest settlement on the Namibian coast with a population of approximately 13,295 (2001 Census), the majority of whom derive their livelihoods from the fisheries sector (white fish and crayfish) and from the marine diamond industry. Like Walvis Bay, many of the workers in Luderitz maintain strong family ties with the northern regions of the country as most of them migrated from there. Although the town has experienced some growth in recent years, this has not been as rapid as in Walvis Bay or Swakopmund, due to the limited growth in job opportunities.

There is a Mullet Fishery operating out of Luderitz. Currently, there are 8 mullet license holders but only 6 have been active over the past 18 months. According to the Inspectorate Division of the Ministry of Fisheries and Marine Resources in Luderitz, the total catch of mullet for 2003 was 17,872.6 kg and the total bycatch for the same period was 21.08 kg.

The Beach Seine Fishery in Walvis Bay operates only in the sheltered waters of the bay. The fishery is year-round, with catches being made mainly in the months of March, April and May. The fishery employs about 30 fishermen operating 5 boats (MFMR Inspectorate, unpublished data). In 2003 there were 13 licensed operators, but 7 of these had been inactive for some years and in 2004 only 5 licenses were issued.

Catches, target species and markets: According to Batty and Tjiputi's report (2004) the catch is predominantly Southern Mullet *(Liza richardsonii)* but the larger Flathead Mullet *(Mugil cephalus)* is also caught (*Bianchi et al. 1999)* and the by-catch includes Barbel, Blacktail, Kob, Steenbras and Galjoen. The annual catch in 2003 was recorded as 132.62 tonnes of mullet, and 2.82 tonnes of other species, valued at approximately NA$ 700,000.00. Mullet is often sold by the piece, rather than by weight so the valuation is approximate, but it is cheaper than most other fish in Namibia and is sought after by less

prosperous consumers. The small mullet are also marketed to recreational anglers for bait for shark fishing. According to Ambabi (pers. comm) the Beach Seine Fishery is commercially run and exports some of their catch to Japan and the USA, in contrast with Hanganeni, which does not export. All Namibians are able to have access to these small commercial fisheries.

7.1.3 The Ski Boat Fishery

This fishery has declined in recent years from 9 boats in 1997 to only 2 licensed vessels at present, operating out of Walvis Bay and Swakopmund (MFMR unpublished data). Most ski boat owners have apparently found the tourist trade to be more profitable than commercial fishing, and now offer recreational fishing, dolphin or seal watching and trips round the bay. The two licensed vessels fish only sporadically, and the catch in 2003 was 10 tonnes valued at NA$120,000. Ski boats use handline gear to catch Kob, but mainly target Snoek (*Thyrsites atun)*, when shoals of this fish are accessible. The ski boat fishery provides intermittent employment for about ten fishermen.

7.2 INFORMAL ACTIVITIES

Although it is illegal for persons without a commercial fishing right to catch fish for sale in Namibia, enforcement of this law is problematic. MFMR inspectors patrol the beaches on a daily basis checking permits and catches, but they have a large area to cover and cannot monitor fishers when they leave the fishing areas. Both finfish and other marine products are frequently offered for sale in the coastal towns (M. Batty, pers obs). This informal activity ranges from genuine recreational anglers, who may occasionally sell part of an exceptional catch to offset their costs; through students who dive for rock lobster to earn pocket money in the Christmas holidays; to a small group of rod and line fishermen who fish regularly and almost exclusively for the purpose of selling their catches. The existence and activities of this latter group are recognised in official publications, such as Hampton (2003), where they are described as ‘subsistence fishermen’. These beach fishermen use the same techniques and target the same fish species as members of the Hanganeni association, but either walk or cycle to their fishing areas. They are based mainly in Swakopmund and Henties Bay, although there is also a small group of dependents of employees at the Terrace Bay resort who operate in the same way. Luderitz and Walvis Bay have less suitable conditions for beach fishing in the immediate vicinity (and perhaps more alternative employment opportunities).

As with many informal activities, it is difficult to quantify the number of fishers and the economic importance of this fishery. In 1996, Kirchner estimated that the mean number of subsistence anglers on any given day to be 21 (variance 5), catching an average of 54 fish per day in total. Their expenditure in the local economy on bait, fishing gear etc was considered to be negligible. More recently, Holtzhausen (pers. comm.) estimated the total number of subsistence fishermen to be 'less than 150'. In the first three months of 2004, licensing officers in Henties Bay identified six buyers of recreational fishing licenses as 'regular fishermen' operating outside the Hanganeni Association.

Due to the popularity of Henties Bay as a destination for recreational angling, artisanal fishermen in this town often supplement their income by working as fishing guides or ghillies for visiting anglers. Collection of bait for sale to anglers is also practised. White Mussel (*Donax serra)* and Octopus (*Octopus vulgaris)* are the main target species because they command the highest prices. There would seem to be no information on the number of persons involved, or the volume and value of their catches.

Rock Lobster (*Jasus lalandi*) occurs along the Namibian coast, and there is a substantial commercial fishery based at Luderitz. The fishing grounds are in very exposed areas, accessible only by commercial trap-fishing boats. In the West Coast Recreational Area (WCRA) (see Figure 2) rock lobster is limited to a narrow subtidal range, due to the lack of rocky substrate and anoxic conditions in deeper water. In this area lobsters are harvested by recreational divers during the open season in summer. Ring nets, although permitted for recreational catching, are not widely used. Conditions are therefore somewhat different from South Africa, where the rock lobster resource supports an active artisanal fishery.

8. RESOURCES AND RESOURCE USE

The majority of fishermen in the small artisanal fishery therefore operate by fishing with rod and line from the beach, targeting four linefish species in the inshore surf zone. These same species are also sought by a much larger number of recreational fishermen casting from the shore. In the same way, the very small artisanal ski boat fishery targets the same species and is matched by a somewhat larger recreational fishery using similar techniques. For the purposes of management, these artisanal fisheries can be considered as a part of the recreational fishery, using the same techniques in the same fishing areas, and distinguished only by the fact that the activity is to earn a living rather than as a hobby.

The dominant species in the recreational and artisanal fishery, Silver Kob (*Argyrosomus inodorus)* and West Coast Steenbras (*Lithognathus aureti),* are also targeted by a commercial linefish fishery of 12 licensed vessels (9 currently active). These boats, of about 20 metres overall length, operate out of Walvis Bay, with crews of handline fishermen. In recent years, their total catch of Kob has exceeded that of the recreational fishery (Kirchner & Beyer, 1999; Hampton, 2003). Catches of Kob and Steenbras have also been occasionally recorded from industrial trawlers targeting Hake and Horse Mackerel respectively, with landings of tens of tonnes in some cases (MFMR Fisheries Management Information Database).

9. BIOPHYSICAL OCEANOGRAPHIC INFLUENCES

Authorities have commented on the impact of environmental conditions on the availability of inshore linefish to shore and boat anglers. Rough seas, spring tides, sulphurous eruptions and warm water events all reduce fishing success (Holtzhausen et al., 2000; Kirchner, 1998). On the other hand, effects of the environment on the longer term distribution and abundance of linefish species have not been formally studied. Hampton (2003) suggests that as most of the linefish are predators environmental effects are likely to be secondary through more direct impacts on their prey. Direct effects have been recorded occasionally, however, such as during the 1995 Benguela *Niño* when large numbers of dead and dying Kob were recorded at the coast (Gammelsrod et al., 1998).

10. LIFE HISTORIES OF MAIN SPECIES

Kob

Two species of Kob, known locally as Kabeljou, occur in Namibian waters: the Silver Kob, *Argyrosomus inodorus;* and the Dusky Kob, *Argyrosomus coronus.* The two species are difficult to distinguish, but except for the extreme Northern section of the coast, Silver Kob are more common. Kirchner, 1998, has estimated that 90% of the Namibian catch comprises Silver Kob, and research on Namibian stocks has focussed almost exclusively on this species.

Although Silver Kob also occur on both coasts of South Africa, the Namibian population is considered to be discrete from the South African stock. It is a relatively fast growing fish, attaining a length of 40 cm in about two years. Median age at sexual maturity for both

males and females is around 1.5 years. Silver Kob grow to a maximum total length of around 1.4 metres. They feed mainly on shrimp and small fish in the surf zone. Spawning occurs from October to March, peaking in January and February, and the species is a batch spawner. Tagging studies indicate a spawning migration of large adults from Northern Namibian waters to areas south of Walvis Bay. Smaller sexually mature fish do not seem to migrate, however. Kirchner suggests that larval Kob may be carried north from the spawning areas by the prevailing currents, but small juvenile Kob (less than 20 cm) have not been caught in Namibian waters, and this stage of the life cycle remains a mystery. For purposes of management, the Namibian Kob stock is treated as a discrete stock.

Steenbras

The West Coast Steenbras, *Lithognathus aureti,* occurs in Angola, Namibia and the West Coast of South Africa; but it is most abundant in Namibia. Two discrete stocks have been identified in Namibian waters – a southern stock found around Meob Bay; and a somewhat faster-growing Northern Stock, which extends through the WCRA, and the Skeleton Coast Park (Holtzhausen, 1999). Steenbras is a slow-growing, long-lived species, attaining ages of up to 50 years in Northern Namibia (Holtzhausen and Kirchner, 2001) and a total length of up to 1 metre. It is a protandrous hermaphrodite, so only the older and larger fish become females. Maximum size limits (recreational anglers may not retain more than 2 steenbras of more than 65 cm overall length per day) are designed to protect these large female fish. Both juveniles and adults are found in the surf zone, and feed mainly on molluscs and other invertebrates. Tagging studies have not revealed any regular pattern of migration, although there is some movement of fish from the SCP into the WCRA perhaps as a result of the greater fishing pressure in the latter area. For purposes of management, Namibian stocks are considered to be a discrete stock.

Other Linefish

Unlike Steenbras and Kob, other targeted linefish have not been the subject of intensive research in Namibian waters. General information on the life histories, from South Africa and elsewhere, is collated in the Fishbase Website (2004). **Galjoen** (*Dichistius capensis)* occurs from S. Angola to Natal, and is the national fish of South Africa. It is found in inshore waters, typically around rocks, and feeds on molluscs and other invertebrates. Attaining a total length of 80 cm, it is a slow growing species considered to have low resilience to exploitation. Adult fish spawn in deeper water from October to March, and perhaps as a result, the fishing for Galjoen is considered to be best in the winter months. **Blacktail** (*Diplodus sargus capensis)* is the smallest of the four main target species, attaining a total

length of 45 cm. It is distributed from Angola to Mozambique. An omnivore, it feeds on seaweeds, sponges and invertebrates, with both adults and juveniles found in shallow coastal waters. It is considered moderately resilient to exploitation. In S. Africa, spawning has been recorded from May to December. Research on management of Galjoen and Blacktail has been carried out in South Africa, on both the effectiveness of daily bag limits (Attwood & Bennett, 1995a) and marine reserves (Attwood & Bennett, 1995b). **Snoek** (*Thyrsites atun)* is not caught by shore anglers, but forms a component of the ski boat catch and is important to the commercial linefish fishery. Boyer and Hampton (2001) summarise knowledge of the life history of the species in Namibian waters. There are now thought to be separate spawning stocks in Namibian and South African waters, with no regular seasonal migration between the two areas. There is an inverse relationship between catches off Namibia and South Africa, which may be explained by longer term movements in response to prey availability. Snoek are found in continental shelf areas, attain a maximum length of 2 metres (6 kg) in a lifespan of about ten years, and are a voracious predator on small pelagic fish.

Mullet

There is less information on the life history of mullet in Namibia. The South African Mullet (*Liza richardsonii)* which occurs from Namibia to Natal, attains a total length of 40.5 cm, occurs in coastal waters, and feeds mainly on diatoms and detritus. The spawning season is not recorded, but juveniles are found in estuaries and shallow bays. The Flathead Mullet (*Mugil cephalus)* is a widely distributed species, occurring in tropical and subtropical waters worldwide. It grows to 120 cm Standard Length, usually occurs in schools over sand or mud bottoms in coastal waters, and feeds mainly on zooplankton, benthic organisms and detritus. Because of its wide distribution, it is difficult to rely on generalised observations on growth, spawning etc., and there would seem to be no records from Namibian waters, where it is a minor component of the catch.

11. FISHING METHODS AND EFFORT

Beach Casting

The techniques and equipment used by artisanal beach fishers are much the same as those used in the recreational fishery. Gear normally consists of a fibreglass fishing rod of about 5 metres length and multiplier reel loaded with 15 – 20 kg breaking strain monofilament line. A 100-150 g lead sinker is at the end of the line, and two hooks are most commonly used. Hook size may vary according to the type of fish encountered, with

sizes up to 7/0 used for Kob, and as small as size 4 for Galjoen and Blacktail. Bait used depends on availability, price and target species. Pilchard is generally preferred for Kob, but costs about $15 per kilo. Mussel (*Perna Perna* and *Choromytilus meridionalis)* can be collected on most beaches free of charge, and is effective for Galjoen which will not take a fish bait. Red Bait (the Tunicate *Pyura stolonifera)* is effective for most species, but is only washed up after rough weather. White Mussel (*Donax serra)* is a favourite for Steenbras, but can only be collected at a few exposed beaches. Recreational anglers also use more expensive baits including prawn and squid. There is a prohibition on the use of polychaete worms, but these can be collected free of charge and are reputed to be very effective.

The technique involves casting out the weight and baits, some 40-100 metres from the shore, and waiting until a fish can be felt biting. Fishing normally commences soon after dawn, and ends in the early afternoon, although fishing times may vary depending on tide and weather. In Namibia, there is very little beach fishing after dark. Fishermen will cover many kilometres – on foot, bicycle or (in the case of Hanganeni) by truck, to try a few casts at different spots until they find an area where the fish are biting. Fishermen operate as individuals or in small groups. The accepted unit of fishing effort is a fishing trip or fishing day of about 8 hours mean duration.

Catches are highly variable, depending on weather and sea conditions, as well as the skill of the individual fisherman. In general, September to April is considered to be better than the winter months, although good catches can also be made in winter. For reasons outlined above, Galjoen may be more abundant in winter, whereas large Kob are seldom caught at this time of year.

Handlining

Handlines are the main gear used from artisanal ski-boats, although fishing rods can also be carried. When targeting Kob, a sinker and two 5/0 hooks are the standard gear with pilchard used for bait. The boat is normally anchored just outside the surf zone, and hooks lowered over the side to the bottom.

For Snoek, a lure or jig known as a Snoek Dolly is thrown out and retrieved with a jerky action, normally from a drifting boat. This lure has a barbless hook, so that a fish can be removed quickly once on board, and more can be caught while a shoal is near the boat.

Again the fishing trip (of one day or less in duration) is the accepted measure of effort, although this may need to be adjusted depending on the number of fishermen carried. The

ski boat fishery mainly lands the small Kob that are more plentiful around Swakopmund, in contrast with the commercial linefish boats which target large adults further north.

Beach Seining

Beach seining uses a long shallow net, which is set from a small rowing boat in a semi-circle out from the shoreline over a sand or mud bottom. The net is hauled in by hand, and fish enclosed by the net are thus brought on to the beach.

The fishery in Walvis Bay uses nets of 44 - 75 mm mesh size and about 500 m overall length. Because mullet tend to jump over the headline, the nets are rigged to have a large bag when hauled, thus trapping the fish. Fishing is most successful when shoals can be seen from the shore and encircled with the net. This is most often on calm mornings, when the ripple made by the school is visible. Fishing effort is recorded as catch per day, but could be broken down in more detail as catch per haul, and is again highly variable.

12. RESEARCH AND MONITORING OF RESOURCES

Linefish Research

Early research on linefish resources has been summarised by Holtzhausen et al. (2001) and is tabulated below.

Table 6: Summary of Research topics on linefish resources

Species	Research topic and methods	Researcher and ref.
Linefish caught by angling	Recreational catch from angler catch card returns 1979 - ?	SFRI: never published
Kob, Steenbras, Snoek	Catch trends from landings of lineboats 1964-1986	Venter 1988
Linefish caught by angling	1988 tagging programme to establish abundance, distribution, migrations	Botes 1994
Kob	Taxonomy (identifying 2 species in Namibian waters)	Griffiths & Heemstra 1995

Source: Holtzhausen et al (2001)

In the mid-nineties, major research programmes were initiated on Kob (Kirchner, 1998) and Steenbras (Holzhausen, 1999). These involved tagging studies to investigate migration and growth; otolith reading for aging and growth; length frequency analysis for determination of

mortality; roving creel surveys to establish angling effort and catch; biochemical genetic studies using electrophoresis to determine stock identities; and economic surveys on the value of recreational and commercial fisheries to the national economy.
As well as information on the life cycles of these two species, summarised above, the studies provided estimates of total catch and fishing effort in both commercial and recreational fisheries, and the information required for steady state computer models of the stocks using two yield per recruit approaches. This allowed estimates of stock biomass and yield under different management scenarios to be made. The studies concluded that the Silver Kob stock was at an acceptable level of depletion, but would still benefit from size limits and bag limits; while the recreational catches of West Coast Steenbras were not sustainable and required urgent action to protect larger spawning females. These recommendations have formed the basis for new regulations for the recreational fishery.

Economic analysis indicated that Kob and Steenbras were more valuable to the economy in the recreational fishery than in the commercial lineboat fishery. In the case of Kob, the commercial fishery accounts for nearly 2/3 of the catch, but is only 1/7 as valuable as the recreational fishery. This suggests that the commercial fishery should also be subject to new restrictions, but this has not happened to date.

Linefish Monitoring

Catch and effort in the recreational fishery is monitored by roving creel surveys, although these are conducted at a much lower frequency than during the intensive studies described above. Analysis of creel survey results is the responsibility of the Linefish section of MFMR. The commercial lineboats complete logsheets for each trip, and landings are checked by the Inspectorate. Because of the cramped conditions on board, lineboats are not required to carry observers.

The Hanganeni Association keeps a comprehensive record of the length, weight, species and location of each fish caught by members, which is updated on a daily basis and maintained on a Microsoft Access database by the manageress. The database has only been established recently, but in the longer term could provide useful information on beach fishing catch and effort. Otherwise, data on the catches of artisanal beach fishermen would only be captured by the creel surveys described above.

Because Linefish resources are not subject to quota restrictions, the Ministry of Fisheries and Marine Resources does not prepare annual analyses of the status of the resource, as it does for some of the major commercial stocks. There is thus no published information on

the results of monitoring and data collection for recent years. Kirchner (pers. comm.) believes that recreational catches have declined somewhat in the last five years.

Other Resources

As noted earlier there has been little research carried out in Namibia on the resources of lesser commercial importance that are utilised by the small artisanal fishery. One exception is the White Mussel (*Donax serra)* which was studied as a PhD project. A summary of the thesis is given in Laudien (2002), which concludes that the species is abundant and fast-growing, but that recruitment processes are enigmatic. Harvesting of shellfish and other invertebrates is not monitored in any systematic way, and does not require a recreational license for most species, although daily bag limits are in place.

Catches in the beach seine fishery for mullet are recorded by the operators and submitted to the Ministry of Fisheries and Marine Resources (Ambambi, pers. comm.). Operators are required to inform the Inspectorate before each fishing trip and the total catch for the day is normally verified by an inspector.

13. MANAGEMENT MEASURES AND ISSUES

The recreational fishery, including artisanal beach fishermen outside the Hanganeni Association, is subject to a wide range of management measures laid out in the *Regulations Relating to the Exploitation of Marine Resources 2001.* These may be summarised as follows:

(i) **Closed Areas –** Approximately 2/3 of the Namibian Coast is closed to fishing from the shore;

(ii) **Licensing –** A fishing permit is required for harvesting marine resources other than molluscs and seaweed;

(iii) **Minimum Size Limits –** Minimum size limits apply to Kob, Steenbras, Galjoen, Blacktail, Rock Lobster and White Mussel;

(iv) **Bag Limits –** Daily limits apply to Barbel, Sharks, Snoek, Blacktail, Galjoen, Kob, Steenbras, Lobster, White Mussel, Black Mussel, Limpets, Periwinkles, other Molluscs Sea shells, Mud Prawns, Brown Seaweed and other seaweeds;

(v) **Maximum size/bag limit –** Only two Kob per day and two Steenbras per day above a maximum size limit may be retained;

(vi) **Prohibited baits –** Use of annelid worms and collection of red bait that has not been washed ashore are prohibited;

(vii) **Closed seasons –** There is a seven month closed season for Rock Lobster;

(viii) **Possession Limits –** It is illegal to transport or possess more than one day's catch limit of Rock Lobster or three days' catch limit of finfish species, and finfish subject to size limits must be transported whole.

The Hanganeni Association members are subject to all of the above restrictions except for the bag limits on finfish. In contrast, the commercial linefish boats are not subject to any restrictions on catches or fishing areas. The only restriction is imposed through a limit on the number of licensed vessels. Since they target the same species as the recreational fishery, it has been suggested that this rather negates the value of the recreational fishery regulations.

The mullet fishery is also not regulated except through the number of licenses. Since the fishery is limited to only part Walvis Bay, and the mullet species are widely distributed along the Namibian coast, the fishery would not be expected to have much impact on the total stocks. The sheltered conditions needed for this activity occur only in Walvis Bay and Luderitzbucht, which effectively prevents expansion of the fishery.

The sale of catches from the recreational fishery is an issue on which fisheries managers hold different opinions. Some maintain that, as long as the other regulations are observed, what people do with their fish is their own business. Others point to the high value of the recreational fishery as a tourist attraction, and argue that management should move more towards 'catch and release' and other measures that will conserve large fish for their recreational value rather than the value of their meat.

There seems to be little expectation that the artisanal beach fishery will expand. Catches from the beach are highly variable, but the average catch of 2-3 fish per day does not provide a very attractive income at current prices. The Hanganeni Association currently uses working capital funds to subsidise operating costs, which would seem unsustainable in the long term (Imbamba, pers. comm.).

14. CONCLUSIONS AND RECOMMENDATIONS

Marine resources along the Namibian coastline have been used by indigenous local people for at least 200 000 years although the record suggests that this use was limited to the more sheltered stretches of the coast. These resources, which are based on an eastern boundary current upwelling system constitute one of the richest fisheries in the world. In the late 1960s, there was a great expansion of offshore industrial fishing by international fishing fleets in the vicinity of the Namibian coastline and this also created opportunities for smaller scale fishing activities. Small boats using handlines and set-nets operated in inshore areas through to the 1980s. As with most colonial situations the exploitation of Namibian resources was conducted with little concern for sustainability and provided little benefit to people and the economy of the region. After independence, the Namibian government set about rectifying this matter by developing new marine resource use legislation, excluding foreign vessels from the newly declared EEZ, and ensuring Namibian participation in the fishing industry through shareholding and employment in the sector. Since then the management of the fisheries sector is generally considered to have been good although there are concern that those who have benefited are the more wealthy and educated Namibians, with few benefits accruing to the more marginalized sectors of the population. Despite the archaeological record of historical subsistence resource use, there appears to be limited coastal subsistence or artisanal fishing activity along the Namibian coastline. Although one of the reasons for this apparent limited use is clearly the harsh environmental conditions prevailing along the coast, the other could well be that the subsistence and artisanal fisheries sector is not formally recognised nor catered for in the legislation.

14.1 CONCLUSION

There are few coastal communities living along the Namibian coastline. The harsh physical conditions that prevail along the entire coast have discouraged the development of coastal settlements that are not related in some way to the major industries of diamond mining and fishing. Furthermore, much of the coast has been closed to public access for many years because of the diamond mining industry. Almost the entire coastal population is confined to four main centres, - Swakopmund, Walvis Bay, Luderitz and Oranjemund, and a smaller settlement in Henties Bay. Tourism, fishing and mining provide formal employment opportunities in these centres. Informal fishing activities are severely constrained by the prevailing physical conditions. Thus there appears to have been very limited development

of a subsistence or artisanal fishing sector compared with countries to the north and south of Namibia.

RECOMMENDATION

Given the historical usage of marine resources and the relatively high levels of unemployment within the existing coastal settlements, fisheries management authorities should expend effort in an attempt to define exactly the nature and extent of informal fishing activities occurring along the coast to ensure that groups of marginalized fishers are not discriminated against by the existing legal framework governing fisheries.

14.2 CONCLUSION

Namibian legislation does not provide for artisanal fisheries and there are no formally recognized marine subsistence/artisanal fisheries in Namibia. Government claims that there are no artisanal fisheries in Namibia because there is no coastal community whose livelihood depends on fisheries. Namibian laws identify only commercial and recreational fishing sectors. Subsistence fishing is legislated for under the recreational sector, while commercial fishing includes all fishing activities from which the catches may be sold. However, there are some marine resource use activities by poor coastal fishers that would, in other countries, be considered as artisanal. There is a lack of consensus within fisheries management not only on the understanding of what characterises artisanal fishing but on whether or not artisanal fishers operate in Namibia.

RECOMMENDATION

Given the historical evidence for pre-colonial fishing activities along the coast and the fact that artisanal fishers' livelihoods usually do not depend only on fisheries but on a variety of combined strategies, government should revisit the legislative framework that enshrines the current definitions of fishing resource use categories, in order that informal fishers along the Namibian coast receive due consideration in the light of their socio-economic and resource use situations. It is suggested that government initiate a series of workshops with management authorities from neighbouring countries (South Africa and Angola) in order to arrive at a common understanding of artisanal fishing activities. It is also recommended that government undertake detailed socio-economic surveys of the marginalized sectors of coastal towns in order to arrive at a better understanding of livelihood strategies employed by food insecure people.

14.3 CONCLUSION

The recreational fishing sector (shore and boat based) including the artisanal beach and ski boat fishermen target several of the same species as commercial line fish boats. The recreational sector is subject to a wide range of catch restrictions including effective closure of 66% of the coast to shore fishermen, bag and size limits, prohibited baits and closed seasons. Effort in the commercial line fish sector is only limited through the number of boat licenses issued and there are no catch or area restrictions. Thus any positive impacts generated by management of the recreational fishery would appear to be negated by the lack of controls on the commercial sector.

RECOMMENDATION

Management authorities should institute research and conduct analysis of existing data to determine the effect of such seemingly contradictory regulation of a common resource. Management needs to be able to justify the rigorous control of the recreational sector if the commercial sector, which is likely to have a far greater impact because of much greater effort capabilities, can catch as much as it likes without regard to area, size or season.

14.4 CONCLUSION

Linefish resources are not subject to quota restrictions, and the Ministry of Fisheries and Marine Resources does not prepare annual analyses of the status of the resource, as it does for some of the major commercial stocks. There is thus no published information on the results of monitoring and data collection for recent years.

In the case of the Hanganeni Association fishers, the monitoring, data capture, and data storage procedures of the Association are comprehensive and an asset to effective fisheries management. Length, weight, species and location of each fish caught by members are recorded and the information stored on a Microsoft Access database, which has a dedicated manager. Information derived from this monitoring system should assist in guiding management decisions. However, it is critical that data are not just stored but are subjected analysis that might inform management decisions.

RECOMMENDATION

Government should devote expertise and funding to stock status analyses for line fish stocks, particularly in the light of the crisis situation that has developed in the South African line fishery. The commercial line fish sector targets species that are of major importance to both the artisanal and recreational shore fishing sectors and both these sectors have social and economic components that cannot be disregarded. Stock status analyses would seem particularly relevant since there appears to be some indication that recreational catches have declined somewhat in the last five years.

The monitoring and data collection processes implemented for the Hanganeni line fishery are to be recommended. Both artisanal and recreational fishery sectors in other BCLME countries should liaise with the Association to gain information on their monitoring program and the role of the fishers in this process.

14.5 CONCLUSION

Because of both the apparent very limited size of the Namibian artisanal fishing sector and the main species targeted by the sector, artisanal stock transboundary issues are negligible. The Namibian population of silver kob, considered to be separate from the South African stock, is probably sustainably exploited, and is managed as a discrete stock. The west coast steenbras occurs throughout the BCLME region and is considered over-exploited throughout its range, but Namibian stocks are considered to be a discrete stock and are managed as such. Snoek are not caught by shore anglers but form a component of the artisanal ski boat and commercial linefish catch. Again Namibian and South African stocks are thought to be separate spawning stocks with no regular seasonal migration between the two areas.

RECOMMENDATION

Generally, management of the fisheries sector in Namibia is considered to have been good and authorities should attempt to keep up this record. However, Namibian authorities have concentrated their research effort on steenbras and kob and there is little area specific information about other linefish species such as galjoen and black tail, and about invertebrate resources that are sometimes collected for bait. Management should consider directing effort and funding towards resolving some of the life history issues relevant to management for these latter two species and the available invertebrate resources

14.6 CONCLUSION

In Namibia, the artisanal fishery sector in general is many orders of magnitude smaller in economic importance than the industrial fishery, and very small compared to the recreational sector. Even in terms of participation and employment, it is much less important than the other two sectors. The artisanal skiboat and beach seine sectors are declining and would seem to require no additional management input. There seems to be little expectation that the beach line fishery will expand, but it clearly has some social and economic importance. Information that will be forthcoming from the socio-economic survey of informal fishers along the Namibian coast (LMR/AFSE/03/01/C) should provide further understanding of this group of fishers and their use rights and management needs. There are however concerns regarding the sustainability of a government supported artisanal fishery, namely; the Hanganeni Fishing Association operation, since the Fishing Association currently uses working capital funds to subsidise operating costs.

RECOMMENDATION

Although no additional management input seems to be required for the skiboat and seine net fisheries, the Namibian Ministry of Fisheries and Resources needs to work with the Hanganeni Fishing Association to determine what fishing effort would be both economically and biologically sustainable. The purchase of a skiboat may not necessarily result in a sustainable enterprise. It may be necessary that alternative livelihood opportunities are explored to supplement income from fishing.

KEY CONTACTS

Mr Steven Ambambi the Deputy Director of Technical Services in the Ministry of Fisheries and Marine Resources based in Walvis Bay. He has oversight of the monitoring and data collection from the commercial fishing right holders, as well as enforcement of recreational fishing regulations.

Dr Hannes Holtzhausen is the Senior Fisheries Scientist responsible for linefish resources at the National Marine Information and Research Centre of the Ministry of Fisheries and Marine Resources in Swakopmund. A leading authority on Steenbras, his section deals with 37 species and mainly focuses on large pelagics and sharks at present.

Ms Benitha Imbamba is the Manageress of the Hanganeni Fishing Association, and is responsible for data entry of all catch data as well as financial management of the Association.

Dr Carola Kirchner carried out a major research programme on Silver Kob during the 90's and was responsible for developing computer models of Kob and Steenbras populations. She is now mainly involved with computer modelling of other commercial species.

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People Contacted/Interviewed (Shapi)

1. Mr. Steven Ambambi
   Director, Technical Service
   Ministry of Fisheries and Marine Resources, Walvis Bay, Namibia
2. Ms. Anna N. Erastus
   Director, Policy Planning and Economic
   Ministry of Fisheries and Marine Resources, Windhoek, Namibia
3. Hannes Holtzhausen
   Pelagics
   Ministry of Fisheries and Marine Resources, Swakopmund, Namibia
4. Benitha Imbamba
   Manager, Hanganeni Association
   Henties Bay
5. Mr. Bruce Stewart
   Municipality of Walvis Bay
6. Mrs Aina Uulenga
   Deputy Director, Policy Planning and Economic
   Ministry of Fisheries and Marine Resources, Windhoek, Namibia

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