DEEPFISHMAN

**Case Study 1a
Namibian orange roughy**

Socio-economic study

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1 Introduction

The species under review in this case study is the orange roughy off the coast of Namibia. In Namibian waters the species occurs at depths from 400 to 1100 meters, but is most abundant between 400 and 800 meters. They generally stay within 50-100 meters from the seafloor, and do not undertake extensive vertical migrations.

Figure 1 shows the coastline of Namibia with the four fishing grounds, Hotspot, Rix, Frankies and Johnies, along with depth markings.
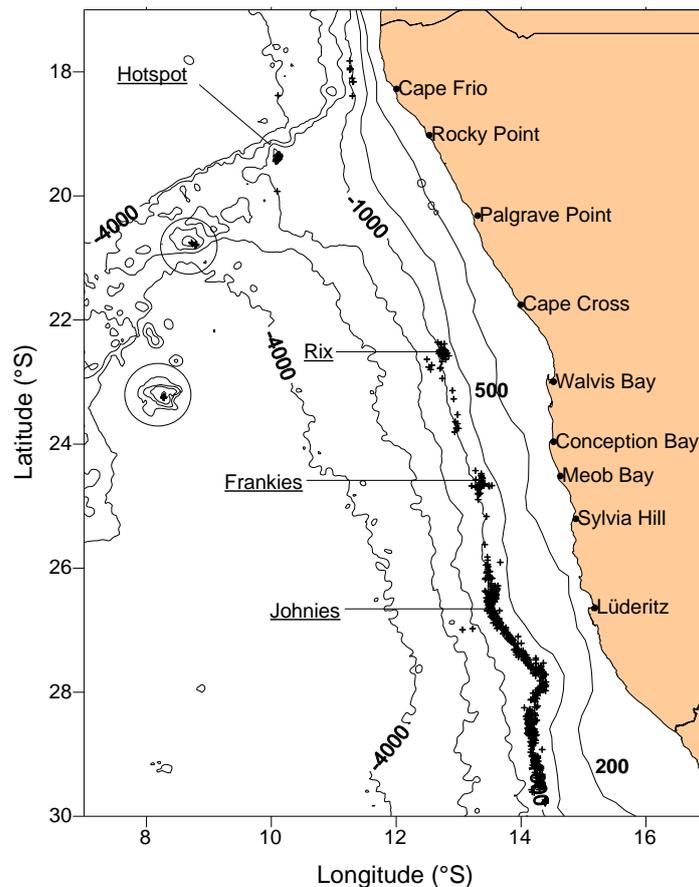

Figure 1 Geographical location of the Namibian fishing grounds.
Source: DEEPFISHMAN Case Study Report 1 A (2010).

2 History of the fishery

The origin of the Namibian orange roughy fisheries traces back to 1994 when an exploratory fishing license was given to a Namibian fishing company to search for commercial deep-water fish species. In January 1995 the first orange roughy aggregation was discovered at

Hotspot, the second ground, Rix, was discovered in April 1995 followed shortly by the discovery of Johnies. The last ground discovered was Frankies in early 1996.

By 1997 three companies were awarded quotas allowing them to fish in the four Quota Management Areas (QMA's). A total of five demersal trawlers belonging to the three companies were licensed to fish orange roughy in 1997 (Boyer et al. 2001). By 2007 the number of vessels had dropped to only one and total catches declined from around 18,500 tons in the fishing year 1996/1997 to only 270 tons in the year 2006/2007. A joint decision was made by management officials and the fishing industry to put a three year moratorium on orange roughy fisheries (2008-2010).
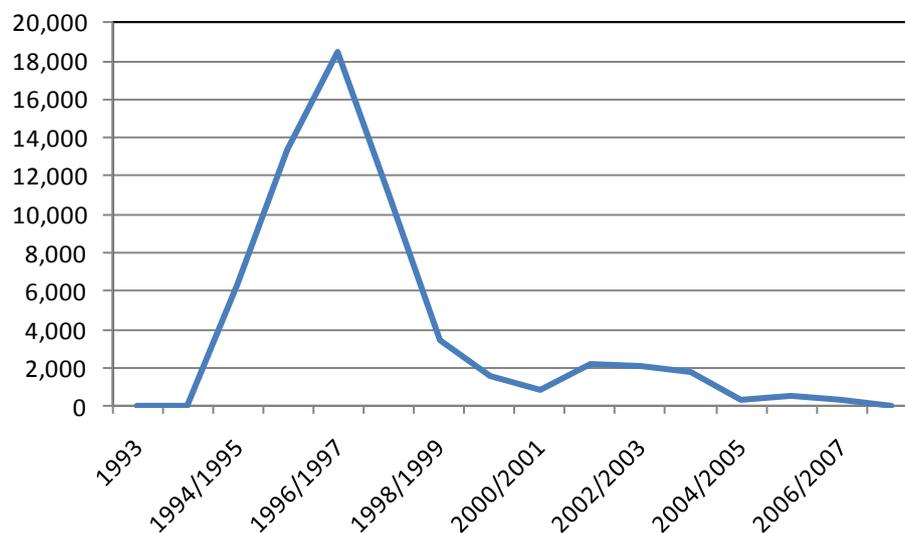
Figure 2 Orange roughy catches in Namibia 1993-2008. Tons.
Source: FAO.

For all the fishing grounds the home port is the same as the landing port, with Walvis Bay and Luderitz the most important ports. The distance to the QMA's from home port is between 100 and 320 nautical miles. All the fishing grounds are within the Namibian exclusive economic zone.

3 Management

The management system of the Namibian fisheries involves setting an annual total allowable catch (TAC) for each QMA and then allocating individual non-transferable quotas. Entry to the industry is contingent on obtaining a fishing right from the Ministry of Fisheries. The

Ministry calls for applications that are then screened according to certain criteria. Effort and capacity limitations are also in place in the Namibian orange roughy fishing industry.

There is substantial uncertainty surrounding the state of the orange roughy stocks on all fishing grounds since the large decrease in abundance indices since 1997 cannot be explained by catches alone. Some have hypothesized that either only a portion of the spawning orange roughy stock aggregates every year, others that the stock is in a resting period, which may span some years after which the stock re-aggregates.

Table 1 provides a summary of deterministic projection information, maximum sustainable yield (MSY) estimates and approximate medium term sustainable yield estimates for the intermittent aggregation model (From 2008 TAC report, The Ministry of Fisheries and Marine Resources of Namibia)

Table 1 Summary of stock statistics.
Source: DEEPFISHMAN Case Study Report 1 A (2010).

	Current depletion B_{2008}/B_0	Intermittent aggregation model	
		MSY	MSYL
Johnies	0.50	562	0.25
Frankies	0.62	639	0.25
Rix	0.13	153	0.25
Hotspot	0.19	112	0.24

B_{2008}: Biomass in 2008, B_0: Biomass at the beginning of the fishery, MSY: Maximum sustainable yield, MSYL: Maximum sustainable yield level.

4 Fleet

The vessels that have taken part in the orange roughy fishery are listed in Table 2. The vessels differed considerably in size, with the largest, the Conbaroyo Quarto, almost double the size of the next largest. The oldest vessel was built in 1974, the newest in 1990. All the vessels are owned by the three fishing companies.

Table 2 Descriptive statistics for the Namibian fleet
Source: DEEPFISHMAN Case Study Report 1 A (2010).

Vessel	Length	GRT	Year built	HP
Conbaroyo Quarto	57	1,269	1988	3,300
Southern Aquarius	54	690	1974	3,000
Whitby	27	192	1977	800
Emanguluko	31	483	1990	1,850
Ulzama	33	264		1,100
Congasa	40	513	1981	1,200

The vessels employed the standard New Zealand "Arrow" rough bottom trawl with cut-away lower wings. Sweep and bridle lengths were 100 meters and 50 meters respectively. A "rockhopper" bobbin rig was used. The net had a 5-6 meter headline height when towed at 3-3.5 knots and had an estimated wingspread of 15 meters. The codend had a mesh of 110 mm. Each vessel spends on average 12 days at sea.

5 Labour

In 2006/2007 there were just two vessels engaged in the orange roughy fishery, the Southern Aquarius and Emanguluko. Each vessel has an average crew of 35 on board. The catch of both these vessels was processed on land by Deep Ocean Processors (DOP). However, because DOP process more species than just orange roughy it is difficult to separate the employees into those who worked on orange roughy and those who worked on the other species. The number of workers employed in the processing of orange roughy is thus unavailable. It is, justifiable that just processing orange roughy did not provide full-time employment for many workers during the year. A third harvester, Atlantic Sea Products, operated a freezer trawler which processed all catches on-board.

According the FAO, the fishery sector including aquaculture is estimated to have employed 5,775 persons in 2003, while the secondary sector, i.e. processing and marketing, is estimated

to have employed 7,925. The total population of the country was then close to 2 million. The fisheries sector and deep-water fisheries in particular, thus only played a minor role in the country's labour market.

6 Processing and markets

Orange roughy catches were processed into fillets, which were land, or sea frozen, fully interleaved and sold in shatter packs weighing between 6 and 10 kilograms per carton. The smaller and skinless fillets were sold in re-sealable retail packages. All catches were exported to markets in the United States.

Table 3 Landings and value of production by fishing season.
Source: DEEPFISHMAN Case Study Report 1 A (2010).

Season	Landings (tons)	Value (N$ million)
2004/2005	1188	N$3.6
2005/2006	267	N$8.2
2006/2007	487	N$3.8

In 2006/2007 total orange roughy landings amounted to N$3.8 million. In value added terms, fishing and fish processing represented 4.9 per cent of the Namibian gross domestic production (GDP) in 2007. However, the decline of orange roughy catches have lowered the fishery's contribution to GDP to a minimum.

References

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