SNF-Report No. 05/03

Assessment of the Economic Benefits African Countries Received From Their Marine Resources: Three Case Studies

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Arne Eide
Peter Manning
Stein Ivar Steinshamn

SNF project no. 5720:
"Assessment of the economic benefits African countries receive from their marine resources: three case studies"

The project is financed by the Department of Environmental Affairs and Tourism, Republic of South Africa

Centre for fisheries economics
Report no. 87

INSTITUTE FOR RESEARCH IN ECONOMICS AND BUSINESS ADMINISTRATION
BERGEN, MARCH 2003

ISBN 82-491-0260-6
ISSN 0803-4036

Assessment of the economic benefits African countries receive from their marine resources: three case studies

Preface

The objective of this study is to give an assessment of the economic benefits African countries get from their marine living resources with special emphasis on whether African states obtain the full value of their exported fish products. The analysis is based on three case studies: South-African hake, Namibian hake and Mozambican shallow water shrimp. The studies of South-African and Namibian hake have been performed by Peter Manning whereas the study of Mozambican shrimp has been performed by Arne Eide.

The main question to be answered is what is the potential resource rent within these respective fisheries, what is the actual realised resource rent and what happens to the actual resource rent? The last of these questions can be specified as follows: how much of the resource rent is collected as tax revenue, to what extent does it contribute to create labour employment and to what extent is part of the resource rent transferred to other countries?

The study also discusses and recommends possible solutions and strategies in order to get greater economic returns from the catch and processing of fish. Finally it is an objective to detect topics that need further investigation and give suggestions for possible extensions of the project.

Detailed description

The study undertakes an investigation of economically important species caught in Southern Africa and addresses the distribution of the catch value and processed value with respect to domestic and foreign groups. Special emphasis is put on the value added chain of processing the fish for foreign markets. The study also puts emphasis on the value of using local labour in catching and processing.

Three species are analysed in this study: hake in South-Africa and Namibia and the shallow water shrimp in Mozambique. The main focus is on how the total income from each of the fisheries is distributed. By total income is meant the value of the catch after it has been processed and sold in the market. To be more precise, we look at how large a share of the value goes to:

- compensate labour input
- compensate capital input
- tax payment

both in the harvesting sector and in the processing sector. Further we try to say something about the degree of excess labour and excess effort both in the harvesting and processing

sector in order to give rough estimates of the potential resource rent. Finally, an important aim of this study is to give an indication of how much of the total value goes abroad, that is, leaves the domestic economies of South-Africa, Namibia and Mozambique in some way or another.

Different sectors within each of the fisheries, that is, different vessel groups with different gear, are dealt with separately to the extent that it is necessary and possible. The Mozambican shrimp fishery are, for example, divided into the artisanal sector, the semi-industrial sector and the industrial sector. The different sectors of the hake fisheries are deep-sea trawl, inshore trawl and longline.

Due to difficulties in achieving all the relevant data needed for this study, we have reservations regarding some of the results.

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ASSESSMENT OF THE ECONOMIC BENEFITS AFRICAN COUNTRIES RECEIVED FROM THEIR MARINE RESOURCES: TWO CASE STUDIES

Chapter 1
Resource Rent in fisheries: objectives and methodology of the study

1 The Objectives of the Study

The overall objective of this study is to assess the economic benefits African countries gain from their living marine resources with particular emphasis given to whether these countries gain the full value of their exported fish products.

The particular objective of this part of the study is to provide an assessment of the economic benefits Namibia and South Africa are receiving from their hake fisheries. Both countries' fisheries harvest the same species namely, merluccius capensis and merluccius paradoxus, and both countries have similar histories of the exploitation of their fisheries resources. Both employ largely similar technologies, and both are attempting to reshape their fishing industries to the greater benefit of their respective countries and their people. In both countries the Cape hakes, as the two species are often collectively known, are together the most important commercial species, earning approximately half of the revenues accruing in the fisheries sectors.

2 Resource rent in fisheries

The concept of resource rent is fundamental to this analysis. Consideration of what happens to resource rent, or potential resource rent, associated with the utilisation of a natural resource has important implications for the success of a national development strategy.

2.1 The Concept of Resource Rent

Resource rent is a concept that relates the demand for a natural resource to its scarcity. It may be defined as revenue accruing in excess of that needed to cover costs, when costs include a return to capital and labour, to risk and to entrepreneurship. Resource rent refers to profits in excess of 'normal' profits, which are profits that that an entrepreneur would expect to earn through any other enterprise in the economy. Normal profits are not some fixed rate of profit but essentially represent the opportunity costs of the fishing enterprise.

When the demand for a renewable natural resource exceeds the capacity of the resource to supply, it begins to produce a rent. In these circumstances, where there is not a sufficient supply of the natural resource to meet the demand for it, it is not sustainably possible for fishing enterprises to respond to price increases by producing more. Once the fishery has been fished down to the optimum productive level of biomass, any further increases in catch will result in a reduction of the biomass below the level of optimum productivity, and eventually to smaller catches at greater cost. Ultimately the limit of what can be produced is determined by how much the resource can produce. This induces people in the marketplace to compete to secure a share of the limited production

for themselves. Profits in excess of what could be considered normal profits are generated. These excess profits are what we referred to as resource rents.

2.2 Conditions where resource rent accrues

In fisheries there are two sets of conditions in which resource rent is generated. The first is when a fishery is developing, that is, when the supply is still sufficient to meet the demand, regardless of whether there is an effective management regime in place. As fishing effort targeting the stock increases, the fish stock is fished down to its optimal level of productivity, at which point the resource rent is maximised. It is precisely the presence of this resource rent which, under conditions of open access, leads to an increase in fishing effort until all the resource rent is dissipated. Both the South African and Namibian hake fisheries have long since passed through this development phase.

The second set of conditions in which resource rent is generated is in a mature fishery where there is a management regime that effectively limits fishing effort. The more effective the management regime is in limiting fishing effort to the level at which the harvest is economically optimised, the greater will be the rent realised. Again, both South Africa and Namibia have reasonably effective management regimes for the hake fisheries, creating the conditions in which rent can be expected to be generated, although not necessarily optimised.

3 Magnitude of resource rents

Resource rents associated with some fisheries can be very large. This is particularly true of many high value ground fish species, such as hake. The US National Marine Fisheries Service estimated net revenue for New England groundfish was about 65% of gross revenue, indicating a high percentage of resource rent (FAO 1992). Technically attainable rents for many mature fisheries typically exceed 50% of the landed value of the catch (Arnason 1991).

Resource rent will vary over time according to physical and biological parameters and market conditions.

3.1 Influence of environmental variation

The degree of dispersion or aggregation of a particular stock will determine, in part, how costly it is to catch. Variations in costs relating to changing environmental conditions have an impact on how much resource rent is generated.

The marine environment on which southern Africa's hake stocks depend is variable and the variation in the associated costs of harvesting the resource are reflected in the catch per unit of effort (CPUE). CPUE data for the South African west and south coast hake fisheries (Figure 1) and for the Namibian hake trawl fishery illustrates the point (Figure 2). Between 1993 and 1994 the CPUE for the Cape west coast hake fishery arose from 106.87 kg per minute to 156.63 kg per minute, a rise of some 46.6%. The following year, which coincided with a Benguela Niño event it dropped back down to 95.23 kg per min, a

fall on the previous year of 39%. Between 1993 and 1994 the CPUE for the west coast hake fishery arose from 106.87 kg per minute to 156.63 kg per minute, a rise of some 46.6%. The following year it dropped back down to 95.23kg per minute, a fall on the previous year of 39%. The Namibian CPUE (Figure 2) for the hake trawl fishery reflects the same pattern as the CPUE for the Cape west coast, although a different methodology in measuring it is used.

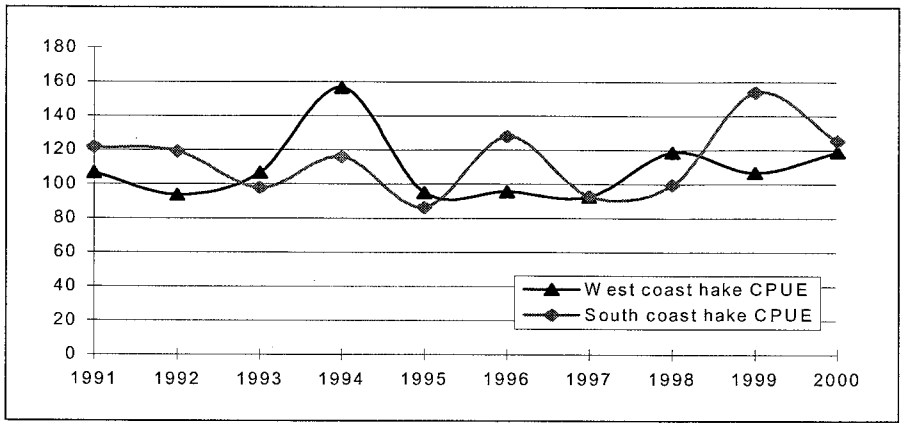

Figure 1: CPUE for the South African west and south coast hake fisheries (kg/min) (MCM).

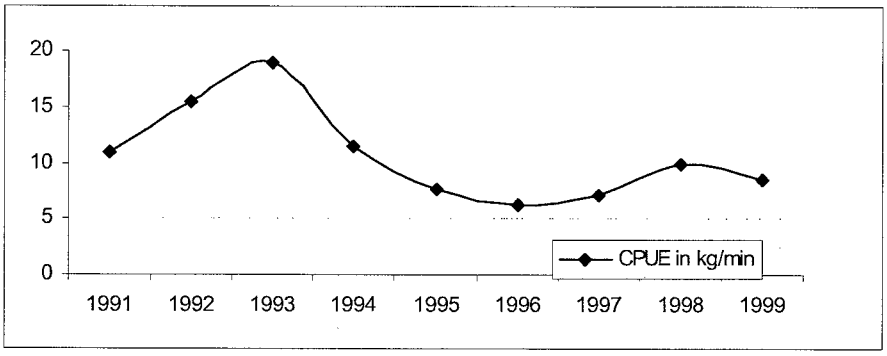

Figure 2: CPUE for the Namibian hake trawl fisheries (kg/min) (MFMR).

Under such circumstances the costs of harvesting are going to vary from year to year. The optimal fleet size may to be smaller than that required to catch the TAC during periods when the CPUE is at its highest and will depend on the costs and revenues of harvesting. The data are not available to estimate the economically optimal size of the fleet.

3.2 Changing market conditions:

Changing market conditions also have an impact on the generation of resource rent. A shortfall in supply is likely to result in price increases and higher rents being generated until the point is reached where market resistance to further price rises brings about a substitution effect.

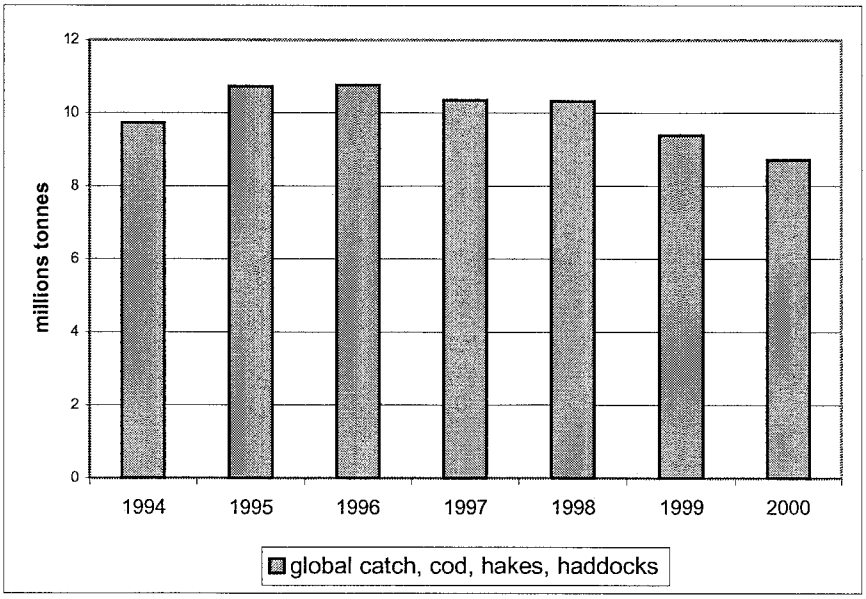

Figure 3: Global catch of cods, hakes and haddocks between 1974 and 2000. (FAO, 2000)

3.2.1 Impact of supply and demand

Oversupply in relation to demand will reduce prices and may eliminate rent associated with a particular stock. What is more generally the case in relation to ground fish species is that supply cannot meet the demand, thus inducing consumers to compete for what is available, creating a scarcity value.

The supply of close competitors in the market also influences prices. However, the global supply of commercially important goundfish species, namely the cods, hakes and haddocks, has declined overall in recent years from 10.77 million tonnes in 1996 to 8.72 million tonnes in 2000 (Figure 3) (FAO 2000). This, coupled with the fall, during the last few years, in hake production from Argentina, the EU's main source of hake during the 1990s, has generated an upward pressure on hake prices.

3.2.2 The significance of species characteristics

The hakes are made up of an assemblage of fish species with significant differences in biological and product quality characteristics between them. These include fat content, flesh texture, bone structure and size which affect their suitability for processing, market acceptance and price (Sjøholt 1998).

Aggregate information shows that hakes characterised by a whiter, firm-flaky texture with a relatively small fat layer and few parasites tend to be used for the fresh whole and fresh fillet market which fetch the highest prices (Alheit et al, 1995). While the Arctic queen and European hake are regarded as excellent for these characteristics, the Cape hakes are regarded as 'good'. Although both Cape species are marketed as Cape hakes, the deepwater Cape hake (m. paradoxus) is regarded as having the firmer flesh, perhaps

explaining why the deep water hake has been more heavily exploited than the Cape hake (m. capensis) in recent years in Namibian waters (Figure 4).

With these favourable quality characteristics, the Cape hakes may be used in a wide variety of product forms, varying from fresh whole fish and fillets to frozen products, such as head and gutted frozen hake and frozen fillets. The Cape hakes thus attract relatively good prices in international markets.

3.2.3 Impact of size on price

A important feature of market prices for headed and gutted Cape hakes in Spain is that there is a very large difference in price per kilogram between small and large fish. The largest size fish may sell for more than 100% more per kg than will the smallest size fish (Globefish, 1994-2002). The size makeup of the catch, therefore, has an important bearing on its value and on the resource rent that might be associated with it.

3.2.4 The price impact of post-harvest handling of catch

The method of catching and handling the fish is also important. Fish that have been handled well, where bruising and abrasions have been avoided, and the catch has been landed fresh, can be sold more readily on the on higher-priced, though more volatile, fresh-fish market within the EU. The trade in fresh hake products from both South Africa and Namibia has grown rapidly in recent years. Eurostat trade statistics show that the mass of fresh hake product supplied to the EU grew by 134% from Namibia and by 37% from South Africa between 1997 and 1999 (Comext).

Fish frozen at sea tends to attract better prices than land-frozen product, which cannot be frozen as soon after capture, and therefore when as fresh, as sea-frozen product. If we consider the discussion in Chapter 3, section 2.1, we are able to get some idea of the magnitude of additional value that may be gained by freezing at sea. The prices gained for freezing the product at sea, in this example, are 42.3% higher than they would be if exactly the same raw material (same mix of sizes of fish) was landed wet and then frozen.

There is a significant difference in the revenue that can be earned as a result of opting to freeze at sea rather than land the fish wet for freezing on shore. In addition, there is also a significant difference in the unit cost of production. The decision whether to freeze at sea or not, has considerable implications for the realisation of potential rent associated with the species.

3.2.5 Impact of management

Changes in the property rights regimes associated with the harvesting of a particular stock may themselves bring about a change in the form in which product is marketed. In the British Colombian halibut fishery, prior to the introduction of an individual transferable quota (ITQ) system, virtually the entire catch was sold in frozen form as a result of the season being very short and intensive. After ITQs were introduced, sales of fresh fish became a very much larger proportion of the market for halibut (Homans et al 2000).

There has been something of a market shift in the hake fisheries in both Namibia and South Africa over the last decade where the fresh fish export market has been targeted.

3.3 Natural resource abundance, rent and economic growth

It is by no means assured that a country will realise the wealth associated with the natural resources with which it is endowed, simply because they are exploited. A country with abundant natural resources is conceptualised as possessing wealth waiting to be released when the resources are exploited. However, Sachs and Warner, two academics from the Harvard Institute for International Development, demonstrated in 1995 how economies with a high ratio of natural resource exports to GDP, tend to have low growth rates. One explanation for this phenomenon is that the countries fail to capture the resource rent and make good use of it (Sachs & Warner, 1995). They cite numerous cases where develop has not followed from the utilisation of resources. It requires a focused effort directed towards making good use of resource rent thereby ensuring that the wealth tied up in the natural resources is used for the good of society as a whole.

An understanding of resource rent generation, or of the potential rent associated with a particular resource, is essential to making informed policy decisions that will lead to a productive process that optimises the use of the resource for society as a whole.

4 Methodology

Systems have been developed in natural resource accounting (NRA) to determine rent associated with natural resources (United Nations, 1993; Nemoto 1996). By determining the rent, it becomes possible in NRA to estimate approximate values of the existing stocks of natural resources.

Gaining such information has important policy uses. If the resource belongs to the people as a whole, the state bears responsibility for ensuring that it is used sustainably for the optimal benefit of society. In the cases of both Namibia and South Africa the public ownership of the resource is accepted. The state has responsibility to ensure that the rent, in whichever way it might be used, is utilised for the good of society.

These types of accounting techniques use aggregated company accounts, reflecting aggregate revenues and costs, and arrive at some approximation of what might be considered "normal" profit. Profits in excess of what is considered normal profit reflect the resource rent.

There are several reasons why such an approach has not been used in this instance. Firstly, and most fundamental of all, this type of detailed data for the South African hake fishing industry is not available and for Namibia is it inadequate.

Secondly, it is questionable as to how appropriate it is to use aggregated company accounts to determine rent associated with a natural resource where there is limited entry into the fishery and the rights, in some form, are tradable. The rent very soon becomes capitalised, and is not reflected as part of the profits (Flaaten et al, 1995). Drawing on the experience of Namibia (Manning 2001), rent has become capitalised through, for

example, the purchase of shares in a quota holding company. Prices well above the nominal value are paid for shares in companies that hold no other assets other than the quota that has been granted to it by government. The purchase of shares in such instances reflects the buyers' perception of the stream of benefits that will flow from a share in that quota. This then becomes part of the capital assets of the purchasing company and the rents are no longer reflected in company accounts[1].

The third reason for not relying on such techniques is that the aggregation of accounts of quota holding companies may not reflect the full costs and revenues of the industry. For example, part of the resource rent may accrue to vessel owning companies or to companies involved in the export of fish and fish products. Indeed, rent may accrue outside of the country and may even accrue to foreign governments through revenues acquired as a result of imposing import duties.

An attempt has been made to use the information available to investigate what rents might exist in South Africa's and Namibia's hake fisheries. As with many other fish species, when examining hake prices it is important to know what products are produced, how they are produced (for example, frozen at sea, plate or tunnel frozen), and whether they are sold as whole fresh fish, or headed and gutted products, or as fillets with skin on, or trimmed, skinless fillets. The per kilogram prices received can vary considerably according to the size of each individual fish and the type of product produced.

Evidence of the size of fish caught each year has been used in conjunction with alternative sources of the prices and values of products have been used to identify possible rent. In particular use is also made of market prices reported by Globefish European Fish Price Reports. Use has also been made of the price of leasing quota, offering, as it does, an indication of the mutually agreed value that they represent. Comparisons are made between the values in the Namibian and South African hake fisheries with those of the import values into Europe of these products published in the EU's statistical databases.

[1] To clarify further, consider an example: If company A were to buy a 45% share in company B, whose only asset is that they have a hake quota (i.e. there are no other assets, like a vessel, to take into consideration). Companies A and B both recognise that the shares are worth more than their nominal value (say of R1.00 each) because they also represent the net present value of the fish that will be caught using the quota granted to Company B for the duration of the right. In other words, both companies do calculations as a result of which they reach conclusions regarding how much the fish will be worth that could be caught in the future using the quota, discounted to represent the real value in the present. This represents the estimated resource rent which is expected as a result of controlling the quota. They then negotiate and settle on a price. The 45% of the shares in Company B becomes an asset of Company A. The anticipated resource rent associated with the quota becomes a capital asset of Company A. The cost of the capital involved in purchasing the shares in Company B will be a cost for Company A and will be offset against the revenue, thus reflecting lower profits.

Chapter 2
The South African and Namibian hake fisheries

The most important part of the hake fisheries in southern Africa is dependent on the Benguela ecosystem, one of the world's major eastern ocean boundary current systems. This covers the continental shelf and slope area between the Agulhas retroflection in the South (typically between 36° and 37° south) and the Angola-Benguela frontal zone off Northern Namibia/southern Angola (Boyer and Walker). It thus covers the South African west coast fishery and the whole of the Namibian hake fishing grounds. Merluccius capensis dominates where the continental shelf is relatively wide and thus tends to be more abundant on the Agulhas Bank and off Namibia, while merluccius paradoxus is dominant where the continental shelf is narrow. It is the dominant species in the South African west coast fisheries, where the shelf is narrow and the slope is not too steep (Alheit and Pitcher).

It should be noted that in Namibian waters there has been a marked increase in the abundance of deep-water hake since 1992 (Boyer & Hampton), despite the fact that it appears to be more heavily exploited than the shallow water species (Figure 4). Previously the biomass of deepwater hake was considerably smaller than that of the shallow water species. During the four years 1997 to 2000, systematic catch sampling showed that the deep water hake made up between 62% and 75% of the total hake catch (data provided by MFMR).

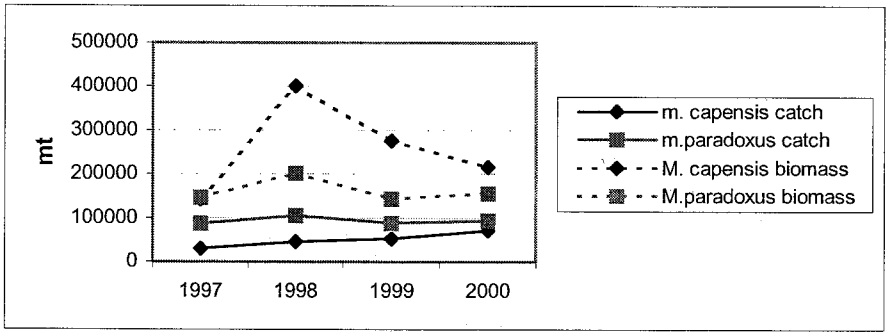

Figure 4: Estimated biomass and catch for M. capensis and M. paradoxus in Namibian waters. (Generated from data provided by Ministry of Fisheries and Marine Resource, Namibia). Note that a much higher percentage of the deepwater hake (M. paradoxus) biomass is harvested than the Cape hake (M. capensis).

1 The historical development of the hake fisheries

The hake fisheries both South Africa and Namibia have followed a broadly similar pattern of increasing exploitation and decline, followed by a period of rebuilding fish stocks.

1.1 South Africa's hake fisheries

The fisheries targeting the Cape hakes are the most important commercial fisheries for both Namibia and South Africa.

The fishery developed in South Africa around the beginning of 20th-century, grew rapidly after World War II, and peaked with catches of more than 300,000 tonnes in the early 1970s (DEATa). Catches then declined. This led to the introduction of management measures, including the imposition of a 110 mm mesh size in 1975. Following the declaration by South Africa, in November 1977, of a 200 nautical mile exclusive fishing zone, it also became possible for South Africa to impose a conservative total allowable catch (TAC), divided into quotas allocated to fishing companies, limit by licence the number of vessels in the fishery, and impose area limitations. These measures, coupled with the exclusion of foreign vessels, have led to a gradual recovery of the stocks (ibid).

1.2 Namibia's hake fishery

The Namibian hake fisheries developed in earnest with the arrival of foreign trawlers from Spain and the then USSR in 1964. During the years that followed foreign trawlers from many distant water fishing nations entered the Namibian hake fisheries. Because of the illegal nature of South Africa's occupation of Namibia, these fishing grounds were regarded as international waters. Namibian waters were, therefore, seen as the last major fishing grounds in which open access was still possible and which was not subject to the control of a coastal state. The South African Government went through the motions of proclaiming a 200 nm EEZ for Namibia in 1981 but the zone received no international recognition (O'Linn and Twohig 1992). The South African Government, because of its illegal status in Namibia, was unable to enforce it.

The total hake catch grew rapidly from the 47 600 tonnes, declared in 1964, to the 815 000 tonnes declared in 1972, the highest hake catch ever declared in Namibian waters (ICSEAF 1983, 1986, 1987, 1989). There was a general downward trend in catches after that until 1980 when the declared catch was 156 300 tonnes (ibid.). Catches then again rose until 1985 but declined throughout the rest of the decade. Post-apartheid fisheries policies

In both South Africa and Namibia, new post-apartheid fisheries policies have emerged during the last decade. The South African Government, through a process of extensive consultation, developed a new fisheries policy in the mid-1990s. Following the independence of Namibia in 1990, for the Namibian Government developed a new fisheries policy in 1991, followed by a comprehensive new Sea Fisheries Act in 1992.

In the cases of both Namibia and South Africa, who the beneficiaries should be of the utilisation of fisheries resources has been a controversial issue in recent years as both countries have grappled with the distortions in the use of fisheries resources that developed as a result of the practice of apartheid. Both countries have had to confront the fact that, overwhelmingly, the white, advantaged part of society had access to, and benefited from, these resources while the black and generally disadvantaged part of

society did not. Justice demands that such inequity be tackled and considerable political pressure built up for this to happen. In both countries this lead to the development of new fisheries policies in which this objective was enshrined and new fisheries legislation that gave expression to it.

1.3 The South African fisheries policy

In South Africa the process of developing a new fisheries policy was initiated following the first democratic elections in 1994.

After prolonged consultations, this process ultimately lead to a White Paper, "A Marine Fisheries Policy for South Africa" and the Marine Living Resources Act (No. 18 (1998)), which took effect in June 1998.

The White paper, in its introduction establishes that:

> "The fisheries policy is founded on the belief that all natural marine living resources of South Africa, as well as the environment in which they exist and in which mariculture activities may occur, are a national asset and the heritage of all its people, and should be managed and developed for the benefit of present and future generations in the country as a whole" (GSA, 1997).

Marine Living Resources Act gives effect to the fisheries policy adopted. Section 2(d) of the Act establishes as an objective the utilisation of "marine living resources to achieve economic growth, human resource development, capacity building within fisheries and mariculture branches, employment creation..." (GSA 1998). Section 2(j) identifies "the need to restructure the fishing industry to address historical imbalances and to achieve equity within all branches of the fishing industry" (ibid.).

South Africa's fisheries policy establishes two fundamental requirements: a) that fisheries resources belong to all of South Africa's people and b) these resources should be utilised on a sustainable basis so that both present and future generations can benefit from them. This places a responsibility on the Government to ensure that the resource rent is utilised in such a way that it is in keeping with these policy objectives.

1.4 The Namibian Fisheries Policy

Namibian Government policy for the fishing industry can be traced from its constitutional roots, through the statement of those constitutional principles in the 1991 White Paper, *"Towards the Responsible Development of the Fisheries Sector"* (GRN 1991), to its expression in the legislation which seeks to implement that policy.

There are two significant objectives articulated in the fisheries policy. The first is to address effectively the depletion of several species which took place before independence and to rebuild the stocks "to their level of full potential" (sic) (ibid.). The second is that the policy aims to maximise benefits for Namibians from this sector both in the harvesting of fish and in the processing industry. The policy aims to encourage more employment of Namibians in both the fishing and processing industries and through the development of support and service industries (ibid).

It should be particularly noted that the white paper also identifies a responsibility of the Government as "constantly assessing the social impact of resource exploitation, such as equity" (Ibid.).

It is thus clear in the case of both Namibia and South Africa that fisheries resources are publicly owned and the resource rent associated with them, like that of mineral resources, belong to the people as a whole. There is also a clear commitment in both countries to achieving greater equity in the use of these resources.

1.4.1 The Marine Resources Act

The promulgation of the Sea Fisheries Act in 1992 and the publication of the Sea Fisheries Regulations in 1993 further reflected the development and the implementation of the fisheries policy. The 1992 Act was superseded by the Marine Resources Act (2000) which came into effect in August 2001 (GRN 2000). The thrust of policy implementation in the new act broadly follows that of the 1992 Act. Two major innovations deal with the establishment of the a Fisheries Observer Agency and the incorporation into Namibian law of provisions relating to the regulation of Namibian vessels fishing on the high seas.

1.4.2 Policy on poverty alleviation

The emphasis given to poverty alleviation in Government policy makes it appropriate to interpret the above orientation of the fisheries policy in the context of the Government's broader policies on alleviating poverty. Based on 1993/4 data, Namibia has one of the world's most unequal societies with a Gini coefficient of income distribution[2] of 0.7 (UNDP 1999, p8). While 5% of the population enjoy incomes of 5 times the average income, 50% of the population are forced to survive on incomes that are only 0.1 of the average. The top 5% of the population have incomes approximately 50 times greater than the half of the population on the lowest incomes (ibid.).

1.5 Similarities in policy

Although envisaged in different ways, the policies of both countries are oriented towards gaining greater benefit from marine resources for people whose opportunities had been limited by the apartheid policies which afflicted both countries prior to the 1990s and the development of new policies.

2 The management systems

The summaries of the management systems provided below are intended provide the a minimum description of the system as it applies to the hake fisheries and are not intended as a comprehensive description of the systems.

[2] This is a frequency distribution measure where perfect equality equals zero and perfect inequality equals one.

2.1 *The Namibian fisheries management system*

The Namibian fisheries management system is based on the Marine Resources Act (2000), which entered into force in August 2001, replacing the earlier post-independence Sea Fisheries Act (1992). The new act basically maintains the system as it was under the Sea Fisheries Act (1992).

The essential elements of the system are as follows:

A 'right of exploitation' is required to harvest each commercial species of fish or other living marine resource (s32(1)). Rights were granted for period of ten, seven and four years but in June 2001 the periods were changed to fifteen, ten and seven years and a new 20-year fishing right was added.

Total allowable catches (TACs), divisible into individual quotas, are set annually for seven species: hake, horse mackerel, orange roughy, alfonsino, pilchard, red crab and rock lobster. Quotas may only be allocated to the holder of a right of exploitation.

Licenses are required for all vessels fishing in Namibian waters. Licenses are used to limit fishing effort for fisheries not subject of a TAC and quota allocation.

The basis for the length of time a right is granted are as follows:

- A 20 year right may be granted to a company that employs at least 5000 Namibians on land on a permanent basis.

- A 15 year right is granted to a rights holder that is an enterprise at least 90% Namibian owned, with a significant investment in vessels or onshore processing facilities where 50% ownership of these inputs is regarded as significant.

- Ten year rights are granted to all other majority Namibian owned enterprises with at least a 50% interest in a vessel or onshore processing facility in the relevant fishery.

- Seven year rights are granted to enterprise that are majority Namibian owned but which do not have a 50% or greater ownership of a vessel or onshore processing plant in the fishery concerned.

- Note: Variations on these conditions exist relating to the size of the enterprise, the number of Namibians employed and on innovation. If a venture granted a seven or ten year right later fulfill the conditions for a longer term right, then that right may be extended on review by the Ministry of Fisheries and Marine Resources (MFMR). Similarly, if an enterprise no longer fulfils the criteria for which the right is granted, the right may be withdrawn or shortened.

- The structure of quota fees was established to encourage Namibian registration and ownership of fishing vessels. Categories are defined (GRN 2001) as follows:

    - A Namibian vessel is one registered in Namibia, permanently based in Namibian waters, flies the Namibian flag and in which at Namibians enjoy at

least 51% beneficial ownership and whose crew is at least 85% (80% before 2001[3]) Namibian.

- A Namibian-based vessel is one registered in Namibia, permanently based in Namibian waters, flies the Namibian flag, has at least 51% beneficial Namibian ownership and a crew which includes Namibian citizens but of whom less than 85% are Namibian. It also includes foreign-flagged vessels with at least 85% Namibian crew[4].

- Foreign vessels are those that do not qualify as Namibian or Namibian based vessels.

The quota fees, charged per tonne, are based on these definitions of vessels (Table 1). Quota fees were increased by 10% in May 1999 and by varying percentages in 2001:

	Hake quota fees per tonne in N$			
Period when fees where applicable	1994-1999	1999[1]-2001	2001[2]-	% increase 2001 over 1999[3]
Freezer trawlers – foreign vessels	800	880	1450	64.8
Namibian based vessels	600	660	850	28.8
Namibian vessels	400	440	550	25.0
Wet fish trawlers – foreign	600	660	1200	81.8
Namibian based vessels	400	440	600	36.4
Namibian vessels	200	220	300	36.4

Table 1: Hake quota fees applicable in the Namibian hake fisheries. [1]GRN 1999, [3]. % increase on previous levy.

In addition, the following Marine Resources Fund levies, used for funding research and training, are charged per tonne of hake landed:

Whole fish	N$ 22.50 (18.00)
Headed and gutted	N$ 31.25 (25.00)
Fillets	N$ 56.25 (45.00)
Broken sour	N$ 31.25 (25.00)

Table 2: Marine Resources Fund levies for hake. (GRN 2001a))

Fishing vessel licence fees are nominal at N$200pa for a vessels 200mt or greater.

In addition, for each fishing vessel, used as a factory a fee is payable as follows:

-with a gross tonnage of or less than 4499 tonnes	N$ 20
-between 4500 and 8999 tonnes	N$ 500
-9000 tonnes and more	N$ 1000

[3] These definitions of vessels changed in 2001.
[4] Before 2001, a Namibian-based vessel could have less that 51% beneficial Namibian ownership and a crew of whom less than 80% were Namibian.

2.2 The South African Fisheries management system

The South Africa fisheries management system has been in a phase of transition in recent years. An extensive period of consultation culminated in the Marine Living Resources Act (No.18) 1998, which sets out the basis of the fisheries management system, being passed by Parliament.

Any person who wishes to undertake commercial or subsistence fishing, engage in mariculture or operate a fish processing facility, can only do so if granted a right to undertake the activity by the Minister for Environmental Affairs and Tourism, who is responsible for the fisheries (s18(1))[5]. The Minister may make the right subject to conservation and management measures such as restricting the right to the use of a particular type of vessel or gear or to a particular area of fishing (s18(7)).

A commercial fishing right may be leased, divided or otherwise transferred (s21(1)) with the approval of the Minister (s21(2)) who may make regulations regarding the guidelines or criteria governing the transfer of any right (s21(3)(b))

2.2.1 Rights granted in 2002

New criteria were developed for assessing who would be granted rights. In both the deep sea hake fishery and the inshore hake fishery no new entrants were granted rights.

Fishing enterprises were invited to apply for rights, inter alia, in the hake longline, deepsea trawl and hake/sole trawl fisheries on 27th August 2001 and applications needed to be submitted by 13 September 2001 (GSA, 2001). The applications were designed to provide information on the extent to which the applicants met a set of criteria including the degree of transformation[6]; the degree of involvement and investment in the industry; past performance; legislative compliance; degree of paper quota risk.

An application fee of R6000 had to be paid for each application submitted.

On 21 January 2002 the Department of Environmental Affairs and Tourism announced that no new entrants were granted rights in the deepsea trawl or the inshore hake/sole trawl sector so as "not to destabilise the industry", in order "to protect the investment of both established and new right-holders, to encourage future investments and to prevent job losses" (DEAT 2002a; DEAT 2002b)

Thus the TAC 138 495 tonnes for 2002 for the hake deepsea trawl sector is to be shared among 51 existing successful applicants in this fishery. In the inshore hake /sole trawl fishery, 12 applicants share a TAC allocation of 10 165 tonnes for 2002 (ibid.).

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[5] Section references in this section all refer to the Marine Living Resources Act (No.18) 1998.

[6] On the extent to which the applicant included "historically disadvantaged persons" i.e. those "disadvantaged by unfair discrimination on the basis of their race and includes juristic persons or associations owned and controlled by such persons" (GSA 2001).

Rights were granted to 115 applicants in the hake longline fishery, 75 of who were new entrants. (DEAT 2002c). An allocation of 10 840 tonnes of hake is available for distribution amongst long-line right-holders (ibid.).

These rights have been granted for a period of four years

2.2.2 Quotas and fees

The Minister, *inter alia*, may make regulations regarding the formula by which a commercial fishing right as a proportion of the allowable commercial catch, the total applied effort or a combination of these shall be determined (s21(3)(a)). In the case of the hake fisheries this formula involves the division of the total allowable catch into quotas.

The Act empowers the Minister, in consultation with the Minister of Finance, to charge fees for all rights, permits and licences issued in terms of the Marine Living Resources Act and to charge an application fee (s25).

The catch levies charged in the hake fisheries are set out in Table 1 below. The Government announced that it had adopted the "user pays principle" and that the levies are intended to finance fisheries management activities (DEAT 2001). The catch levies receipts are paid into the Marine Living Resources Fund, which is used by the DEAT for marine research, resource management and compliance (ibid.).

Fishery	Levy per tonne whole mass caught (Rand per tonne)		
	2001	2002	2005
Hake deepsea trawl	115	165	315
Hake inshore trawl	115	156	278
Hake Longline	115	165	315

Table 3: Schedule of catch levies to be charged for hake. (DEAT 2001).

A schedule of fees for applications and the granting of rights, permits and licences were published in the Government Gazette (GSA 2001)[7]. A full schedule of catch levies was published in a media release "New fishing levies should strengthen Government's hand" (DEAT 2001)

[7] Found at: http://www.environment.gov.za/PolLeg/GenPolicy/GG_27072001.htm. Catch levies obta

Chapter 3
Rent in the Namibian hake fishery

When the newly elected Namibian Government took office in 1990, the year of Namibia's independence, it faced a serious crisis over the depleted condition of its hake stocks (ch2, 1.2), its most valuable renewable natural resource. As there was no recognised exclusive economic zone (EEZ) for Namibia[8], one of the first acts of the Namibian Government was to pass legislation establishing an EEZ (GRN 1990b). This was followed by decisive action, involving the arrest of several vessels from a fleet of Spanish freezer trawlers, for illegally fishing for hake in Namibia's waters. This brought a rapid end to the open flouting of Namibia's fisheries legislation. Throughout the following decade, the stewardship of the fisheries by the post-independence Namibian Government has contributed to a rebuilding of the hake stocks so that, in recent years, it has been able to set an annual TAC of around 200,000 tonnes.

The fisheries sector, and in particular the hake fishery, has a much more significant role in the Namibian economy than the fisheries sector has in the South African economy in terms of contribution to GDP and export earnings. In 2000 the sector contributed 7.5% to Namibia's GDP, and 23.9% to export earnings in 1999 (Wiium and Uulenga, 2002). Hake accounted for about half the final value in the fisheries sector. Despite fish consumption rising to about 10 kg per person (ibid.) in Namibia at the end of the 1990s, from about 4 kg per person at the beginning of the decade[9], it still leaves in excess of 99 % of the total catch of all species of fish, and virtually all of the hake catch, for export.

1 Data available

Catch and other biological data is much more readily available than economic data for the Namibian fisheries sector. The Ministry of Fisheries and Marine Resources (MFMR) initiated an annual survey of the fishing industry in 1994, as a means of collecting relevant data on the industry and begin the process of building up economic datasets of the industry. Although the survey has the potential of being a valuable tool in the long term, its usefulness is limited at present as a result of the incomplete nature of the data collected. It is also not possible to use the data as a representative sample. The data is incomplete because some companies do not return the questionnaire or return them late and, among those that do return them, the information provided may not be complete. Sometimes, for example, no breakdown of income and expenditure is provided or no product data reported (MFMR 1998a). A further problem is that some companies catch species different to the one for which they have a right, because they do so on behalf of other quota holders. Alternatively they may have a right for more than one species. Some of the company income reported for a particular species may include the income for

[8] The South African Administrator General in Namibia declared a 200 nautical mile exclusive economic zone (EEZ) for Namibia in 1981 (AG12 1981 read with AG32 1979) but, because South Africa was illegally occupying Namibia, the EEZ remained unrecognised and unenforceable.

[9] Namibia has made a concerted effort since 1994 to increase fish consumption through its Fish Consumption Promotion Campaign. 60 to 70% of fish consumed in Namibia is estimated to be harvested by people living in the vicinity of Namibia's northern border rivers. Only bout 4000 to 5000 tonnes of fish consumed in Namibia are of marine origin (Iyambo, 2002).

another species (ibid.). The Ministry itself has pointed out that the shortcomings "definitely influences the accuracy, reliability and quality" of what can be gleaned from the survey (ibid.).

In addition, rent has become capitalised to some extent in Namibia as a result of one or other form of trading the right, such as the purchase of shares in companies which reflect a value being placed on the rights of exploitation and the stream of benefits that can be expected to accrue as a result of acquiring shares (Manning 2001).

Since 1997 the Ministry of Fisheries and Marine Resources has been sampling the whole hake catch. The sampling is undertaken by the on-board observers who have been trained to undertake this task. The sample data is raised to the whole of the catch in order to obtain the size make-up of the catch. Because the prices received in export markets are influenced significantly by the size of the fish, this data is important in calculating the expected value of the catch so that it can be compared with the reported landed and final values.

The Food and Agriculture Organization's Globefish European Fish Price Reports (Globefish 1994-2002) provide detailed price data on the Spanish market, Namibia's main hake market. The price data are specifically for the Cape hake caught in Namibia and South Africa.

Data on the fishing fleet was obtained from the Register of Fishing Vessels (MFMR Register) maintained by the Ministry of Fisheries and Marine Resources, cross checked with, and supplemented by, data extracted from the Register of Ships (MWTC Register), maintained by the Directorate for Marine Affairs of the Ministry of Work, Transport and Communications.

2 Evidence of rent generation

Data offering direct evidence of rent actually accruing in the Namibian fisheries sector is difficult to come by. One indication that rent, in addition to that collected by Government, is being generated in the hake fishery in Namibia, is the evidence provided by the informal market for hake quota.

2.1 Available rent in the Namibian fisheries: the leasing of rent.

In perfect market conditions, the prices paid to lease quota for the year would reflect the resource rent expected from the harvesting of the quota during that year. Buyers and sellers, with their intimate knowledge of the costs and revenues involved in the harvesting, processing and marketing of the fish, will reach agreement on a price that still allows the buyer to cover all costs (make normal profits).

The data on prices paid for quota in Table 4 below is clearly sketchy and has been collected at different times by the author from within the industry. The leasing out of quota is tolerated by the MFMR as a means of accumulating capital for investment in

order that the new small quota holders, the newcomers[10], to become actively involved in the fishing industry. Part of the assessment of companies applying to have their rights of exploitation renewed is the extent to which they have become active operators in the industry. However, the MFMR does not approve of the practice if its purpose is simply to collect rent for the personal enrichment of the shareholders of the company owning the quota (Manning1998). This results in a degree of secrecy regarding the prices paid and the conditions of the deals.

The price data in Table 4 needs to be treated with some caution, however, as the market for the hake quota is not a free and open market. In addition, the probable existence of excess capacity in vessels or processing capacity for some companies may mean that there is a tendency to consider only short-term operating costs (Manning 2001). This, however, does not appear to be a predominant influence on the price of quota because, if that were the case, one would expect quota prices to have risen more than they have done considering the rise in average prices (Figure 5).

Another important factor influencing prices paid for quota is the vulnerability to exploitation by larger companies of the relatively small quota holders, who do not own their own vessels but lease out the quota. Once a quota holder accepts a quota allocation, the quota fees must be paid regardless of whether the quota is caught or not. Larger operating companies may use the power they possess in fleet, processing and marketing capacity to offer prices well below what the quota might be worth in terms of the rent associated with it. An example given to the author while gathering information for this report demonstrates the point. At the beginning of the 2001 quota year, monk quota was leased out for N$ 4.50 per kg but, towards the end the year, quota left uncaught was given away by the quota holders to avoid a situation of being liable for the quota fees but without receiving any income because the quota had not been caught. The general practice is for the fee to be paid by the operating company so that the price paid to lease the quota is free of any expenses.

	Informal prices paid for quota to be landed wet– N$/kg	Informal prices for frozen at sea quota– N$/kg	average prices for landfrozen h&g product adjusted for nominal mass – N$/kg	average prices for FAS H&G product adjusted for nominal mass – N$/kg
1996	0.35	0.85		
1997			5.01	5.31
1998			6.44	6.89
1999			7.15	8.81
2000		2.20	7.23	10.36
2001	0.80	2.50	10.79	15.35
2002[1]	1.20	3.00		

Table 4: Informal market prices paid for quota allocated to be landed wet and for quota allocated for freezing at sea. Average prices for land and sea frozen headed and gutted product, adjusted to reflect price for nominal catch, are extracted from Table 18, where they are calculated using size data from MFMR catch sampling and Globefish annual average prices for each size category. ([1] The prices for 2002 are the average prices expected for the year.)

[10] This term is commonly used in Namibia to refer to the companies which have been granted rights and quotas in the fisheries sector and which had not been in the industry before independence.

It is immediately apparent that the differences in costs and revenues between freezing at sea and producing land-frozen product means that frozen-at-sea quota is considerably more valuable than land-frozen quota, despite higher quota fees being paid to the Government for frozen-at-sea quota. (The differences in revenue are discussed in section 2.5 of this chapter and are particularly highlighted in Table 18.)

In Table 4 above the average prices for land and sea frozen product are adjusted to reflect the nominal mass[11]. This data is graphically presented in Figure 5 below. Note that while the average Namibian dollar prices for hake have been rising sharply, the rate of increase in the prices paid for quota have been much more moderate, which suggests that these prices do not reflect the full extent in the resource rent available in the industry. The most likely reason for this phenomenon is that the small quota holders, newer companies which entered the industry after independence, and who are the sellers of quota, are in a weak bargaining position in this informal market. In contrast, the major operating companies, who exercise considerable power in fleet, processing and financial capacity, in market access and technical know-how, are in a position to extract the major part of the available resource rent (Manning 1998). The distribution of rent within the industry is discussed further in section 2.1.2 of this Chapter.

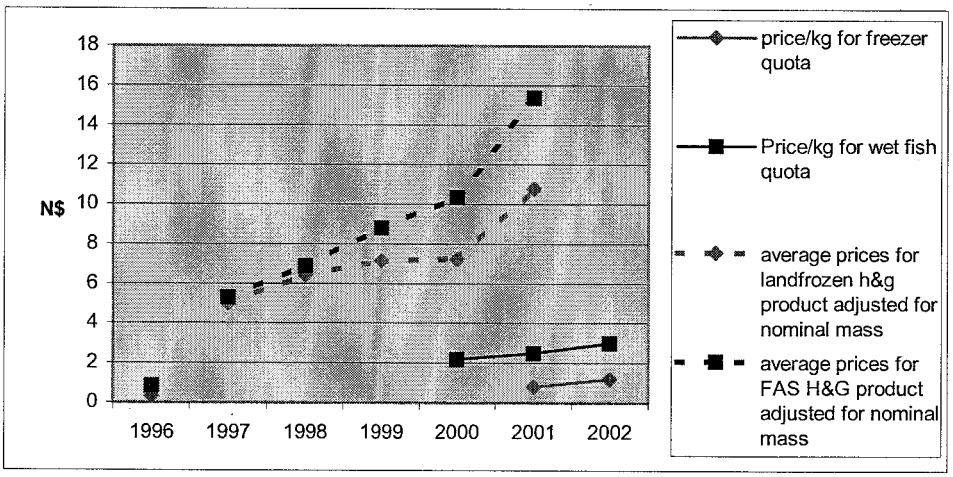

Figure 5: Prices paid for freezer quota and wet fish quota compared to the average price per kg of the catch, valued as frozen-at-sea or land-frozen product.

2.1.1 Rent accruing in Namibia

Considering the above position, rent calculated using the price data in the informal market for leasing quota can be expected to understate the rent actually accruing in the hake fishery. It is nevertheless useful to examine the rent that would accrue in the industry under these circumstances, accepting that there is probably additional rent accruing in Namibia or elsewhere.

[11] The price for headed and gutted product is divided by 1.46.

	TAC mt	Wet fish price N$/kg	FAS price N$/kg	Rent wet fish quota N$m	Rent FAS quota N$m	Total rent N$m
2000	194000	0.70[1]	2.20	81.344	171.147	252.491
2001	200000	0.80	2.50	95.840	200.500	296.340
2002	195000	1.20	3.00	140.400	234.000	374.400

Table 5: Estimate of rent accruing within the Namibian hake fishery based on prices paid for the annual leasing of quota. ([1]. Estimate based on the wet fish quota price being 32% of FAS quota price as in 2001.)

On the basis of the prices paid for quota in Namibia, it is possible to argue that substantial rent accrues to companies in the hake fishery in Namibia, as indicated in the final column of Table 5. These sums may be regarded as conservative estimates of rent not collected by the Government and not dissipated in some other way.

2.1.2 Who benefits from the rent accruing to the industry?

Earlier work analysed in some detail the degree of industrial concentration that has taken place in the Namibian fisheries sector since the implementation of the post independence fisheries policy in the early 1990s (Manning 2001). That analysis, on which this section is based, essentially provides a snapshot of the hake industry in 1999/2000. However, shares continuously change hands and deals struck so that the precise picture presented here changes continuously. However, the broad thrust of the consolidation around a handful of major companies remains true. The 38 rights holders in the hake fishery have increasingly been consolidated into groups of companies dominated by one or other of the big operating companies in the industry. Table 6 summarises the effect of these developments on the distribution of hake quotas. The groupings of companies achieved through the process of consolidation are explained in Appendix A and are reflected in the table.

The table summarises the quota allocation to companies that are the main beneficiaries of the hake quota allocations, breaking the allocations down into those given for freezing at sea and those granted for landing wet. Columns two and three deal with allocations made directly to the companies concerned. These consist of the quotas granted to the companies directly and/or to their subsidiaries. The underlying assumption in this instance is that the benefit of the quotas accrues directly in proportion to the share ownership of companies, so that this would indicate to whom the benefit of the allocations is accruing[12]. The subsidiaries include both wholly owned subsidiaries and those in which the company has a major interest. In the latter case the assignment of the quota of the subsidiary to the major company is calculated on the basis of the percentage ownership of the company. It also includes joint venture arrangements where one party provides quota and the harvesting and processing capacity is provided by the other. The percentage share of the joint venture is used as the basis for dividing the quota.

The fourth column gives the percentage share of the total allocated quota for hake, both that allocated for freezing at sea and that allocated for landing wet.

[12] The validity of this assumption is doubtful in the cases of small companies which have no power within the industry (Manning 1998). However, in the case of the large companies that exercise considerable power within the industry, it is generally valid.

The fifth and sixth columns give further quota from which these major companies are probably benefiting. They are the part of the quota allocated to the newcomer companies calculated in proportion to the shares in those companies, or the shares in the joint venture companies mediating the use of the quota, which remain in the hands of at least some of the shareholders that originally were granted the quota. They are included here because the power relations within the industry arising from fleet and processing capacity, access to finance, and marketing access and know-how, means that the probable beneficiaries of at least some of the uncollected resource rent are the major companies (Manning2001).

	Allocation to Co. + subsidiaries			additional quota	
	Hake wet	hake freezer	% total quota	hake wet	hake freezer
NovaNam[1]	27371	16364	20.2	6493	
Sea Harvest[2]	9604	4945	6.7		
Namibia Fishing Industries[3]	5978	10184	7.5	2753	
Cadilu [4]	2843	10061	6.0		7263
Namib Fisheries[5]	12936	4270	7.9	3393	1355
_ Corvima Investments[6].	2339		1.1	231	
_ other [7]				2387	
Consortium[8]	10739	5592	7.5		
Kuiseb (I&J)[9]	10938	2042	6.0		
National Fishing Corp.[10]	10397	6230	7.7		
Overberg[11]		9216	4.3		
Gendor Holdings[12]	6175	5725	5.5		
Totals	99320	74629	80.3	21749	8518
% of total TAC	75.8	87.23			
% if include additional quota	87.4	97.3			

1. based on estimate that NovaNam claims at least 50% of the rent associated with quota of joint venture arrangements with newcomers. See Figure 9
2. Blue Angra+Llalandii -100% Sea Harvest. See Figure 11.
3. Northern Fishing + Cato Fishing + 55% of Etale's quota. See Figure 10.
4. For additional hake freezer quota, DRDS Correia and J Lloves Vieira, both director of Namivisa Holdings and Oryx Fishing, Helgoland Fishing & Blue Sea is affiliate of these companies (appears linked to Cadilu). See Figure 12.
5. Namib Fisheries + 72% Saddle Hill quota (1996 data) + 46% Namibia Marine Resources. See Figure 12.
6. includes 91% of Agatha Bay's quota. See Figure 12.
7. see Figure 12 , full nature of links unclear but JL Bastos is director of Namibia Fisherman Association which has 100% interest in Swordfish Namibia.
8. 95% beneficial shareholders - List family.
9. 49% Irvin and Johnson - I&J retain management control by agreement (Manning1998). Figure 13
10. Government owned company. Quota caught by subsidiary company, Seaflower Whitefish Corp. which has minority Iceland interest.
11. Relatively more wealthy owners with access to finance. Grown considerably since independence
12. Lost hake quota in 2001. Hake quota was gained through 100% owned Eros Fishing and Mangetti Fishing. Bought monk concession from Namcoast (Pty) Ltd. Gendev, major shareholder, have horse mackerel and pilchard quotas. Figure 14.

Table 6: Summary of quota allocations (1999) to larger enterprises. (See Appendix A for further explanation.)

If the hake quotas allocated directly or indirectly to the major companies are considered, then in 1999 they received the benefit of about 80.3% of the total hake quota. This is based on the assumption that any resource rent available would accrue according to the distribution of shares in the companies concerned. Thus, where there are joint venture

arrangements between newcomer companies and major operating companies, or where shares are held by the major companies in the newcomer companies, then the quota, and therefore the rent, is assumed to be allocated in those proportions. However, while it is evident that the newcomer companies are receiving some proportion of the rent, there is evidence to suggest that it is unlikely that they are managing to capture the full share of the rent in proportion to the shares that they hold (Manning 1998).

The set of quotas shown in the table accounts for all of the 19 freezer trawler allocations of hake quota and 25 of the 31 allocations of wet fish quota[13]. This does not mean that the remaining six wet fish allocations are harvested and processed independently. It was simply the case that, due to the financial and time constraints of that research project, the arrangements surrounding the harvesting of these quotas were not traced at the time.

The principal point to be drawn from this is that by far the greater proportion of the total quota allocated goes to the big players in the industry and it is they, rather than the newcomer companies, to whom resource rent mainly accrues. Given the unequal nature of relationships in the industry, the major companies probably capture an even greater proportion of the resource rent than is reflected by the above distribution of quotas. Thus from a policy perspective it is clearly not the case that the newcomers, the real targets of policy, are gaining appreciably from the quota allocations.

A second notable point is that most of these major fishing companies also have significant quotas in other fisheries. Two of them, Sea Harvest (Lalandii) and the National Fishing Corporation (Seaflower Lobster Corporation), have two thirds of the rock lobster quota and five of the companies have rights in the monk and sole fishery, and together they have 23% of the pilchard quota, although the biomass of this stock has been extremely low in recent years. Rights are also held in the horse mackerel and tuna fisheries. One of them, Gendor, which has since lost its hake rights, has half of the orange roughy quota. It should also be noted that Sea Harvest and Irvin and Johnson benefit directly from about 60% of the hake quota in South Africa.

2.2 Export of rent? Comparing Namibia's export data with Eurostat import of data

In section 3.2.3 of Chapter 1, the impact of size on the unit price of the product is briefly discussed. There is no detailed breakdown of the product types or sizes for the Namibian hake fishery that is publicly available. However, Eurostat provides some information on mass, categories of the product, and value for Namibian hake imports into the European Union.

Namibia exports a substantial proportion of its hake production to the European Union. Hake exports from Namibia to the EU for the three years 1997 to 1999, are estimated to account for 75%, 81%, and 77% respectively of the nominal catch (Table 8) during those years.

Eurostat publishes data on broad categories of imports of Namibian hake. Data is provided for fresh/chilled hake, frozen hake which are not fillets (virtually all headed and

[13] As can be seen from the table, most major companies have both freezer trawler and wet fish allocations.

gutted), and for frozen fillets. The mass of these product categories for 1997 to 1999 are provided in Table 7.

Reporting countries : 000 EUR Partner countries : 389 Namibia				
Units : Metric Tonnes Flow : Import Statistical procedures : SP4				
Period	Products			
	3026966	3037811	3042055	Total
1997	5837	17606	27142	50585
1998	10340	16675	41517	68532
1999	13630	26671	35259	75560

Product key:
03026966 .97- fresh or chilled cape hake 'shallow-water hake' 'merluccius capensis' and deepwater hake 'deepwater cape hake' 'merluccius paradoxus'
03037811 .97- frozen cape hake 'shallow-water hake' 'merluccius capensis' and deepwater hake 'deepwater cape hake' 'merluccius paradoxus' except fillets.
03042055 .97- frozen fillets of cape hake 'shallow-water hake' 'merluccius capensis' and of deepwater hake 'deepwater cape hake' 'merluccius paradoxus'

Table 7: Mass of imports of hake from Namibia into EU extracted from Eurostat.

Using the conversion factors utilised in Namibia for calculating the nominal mass equivalent, estimates of the nominal mass represented by these exports is calculated in Table 8. As the total nominal catch is known, it is possible to calculate the percentage of the total nominal catch used in the production of these products exported to the EU.

	3026966[a]	3037811[b]	3042055[c]	total nominal mass of hake exported to EU	% of total nominal mass of hake exported to EU	total nominal catch
1997	6070	25705	56862	88638	75.4	117583
1998	10754	24346	86978	122077	81.0	150695
1999	14175	38940	73868	126982	77.3	164250

Mass for each product type multiplied by conversion factors (FIH, 2001):

a Gutted 1.04

b Headed and gutted 1.46

c As no detail is provided, half assumed trimmed skinless fillets 2.25; half untrimmed skin-on fillets 1.94

Table 8: nominal catch exported to EU, calculated from mass of each product type taken from Table 7 above using conversion factors.

The values of these exports in Euro are published by Eurostat and reproduced in Table 9. Using annual average exchange rates[14], these values are converted into Namibian dollars and raised to the value of the whole catch. This calculation implies the assumption that the remaining 19% to 25% of the nominal catch has a similar product mix to that exported to the European Union.

[14] As the N$ is kept at parity with the South African Rand, the SA Rand/US$ rate is the relevant rate of exchange.

Reporting countries : 000 EUR Partner countries : 389 Namibia									
Units : 1000 ECU Flow : Import Statistical procedures : SP4									
	value in '000			value in N$'000[1]					N$'000
Products	3026966	3037811	3042055	3026966	3037811	3042055	total	%nominal mass	value raised to 100% of nominal mass
1997	20842	25046	52447	108576.4	130477.1	273222.6	512276.2	75.38	679563.5
1998	41600	27173	88435	257961.6	168499.8	548385.4	974846.8	81.01	1203374
1999	51734	43791	77362	337305.7	285517.3	504400.2	1127223	77.31	1458047
[1]Exchange rates : 1997: 1ECU=N$5.2095; 1998: 1ECU=N$6.201; 1999: 1ECU=N$6.52 (SA Reserve Bank)									

Table 9: Eurostat data providing the value of hake imports from Namibia into the EU, converted into N$ values, and raised to estimate value of total nominal catch.

The value of the total nominal catch arrived at in this way includes transport and other related costs. There are no import tariffs for Namibian fish products imported into the EU. In the absence of data on transport and related costs from Namibia, the transport costs from South Africa are used to calculate the cost of transportation. As the Namibian trade is substantial and Namibia is closer to EU market than is South Africa, the costs from Namibia should at least not be more than those from South Africa.

	Value of total catch based on mix of products exported to EU N$'000[1]	transport and related costs per kg (SA data)[2]	Total mass imported into EU[3]	% of total nominal mass of hake exported to EU[4]	Mass of whole catch made up of product mix of Namibian hake imported into EU. - mt	transport and related costs associated with mass of whole catch - N$	Import value into EU less transport and related costs. N$'000	export value of hake from Namibia in N$'000[5]	Difference in export values N$'000
1997	679563.549	2.17	50585	75.40	67088.85942	145582824.9	533980.7241	?	?
1998	1203373.94	2.39	68532	81.00	84607.40741	202211703.7	1001162.236	946300	54862.24
1999	1458047.12	2.63	75560	77.30	97749.02975	257079948.3	1200967.172	837400	363567.2

Table 10: Difference in values, comparing Eurostat data for imports into the EU with Namibian export data. ([1] transferred from Table 9; [2] Using SA freight and related costs. As Namibia is closer to the EU market than SA, these costs should at least not be more than those for South Africa; [3] from Table 7; [4] from Table 9; [5]Fishing Industry Handbook 2001).

The import value less transport costs, which should equal the export value from Namibia, thus is calculated using Eurostat data. This may be compared to the reported value (FIH 2001) of total hake exports (over 99 percent of the hake catch). The final columns of Table 10 shows that there is a significant difference between the value arrived at from the import data into the EU and from the export data from Namibia. These values are N$54.86 million and N$ 363.57million for 1998 and 1999 respectively. This suggests that there is significant resource rent accruing abroad.

2.3 Revenue collected from the fishery by the Government

Since independence, the Namibian Government has succeeded in recovering the costs of management for at least most of the period. This is an exceptional achievement in one sense, because so few governments, if any, have achieved the same. However, it must be kept in mind that the Namibian fisheries resource is very large in relation to population size and that it is relatively easy to monitor and control because there are only about 300 licensed fishing vessels in the fishery and two ports at which fish can be landed.

A brief outline of the fisheries management system was provided in Chapter 2, section 2.1, providing details of the fees and levies charged in the fisheries.

Each fishing entity, whether a company or individual, must have a right of exploitation to harvest Namibia's marine fisheries resources. Quotas are issued to rights holders in eight fisheries, including the hake fishery. Quotas are not transferable except with permission of the Minister. A levy is charged on the quota allocated to, and accepted by, the rights holder and not on the catch, as is the case in South Africa. The levy charged is structured in such a way as to encourage the use of vessels that are Namibian owned and crewed (Table 1).

2.3.1 Cost of management

The cost of managing the fisheries is summarised in Table 11. The figures include capital costs, which are spread over a ten year period (Wiium & Uulenga, 2002 forthcoming). The expenditure is financed from the central Government budget, the Marine Resources Fund and the Fisheries Observer Fund. The fall in management costs in 1999 was due to the sale of the Ministry's helicopter and a patrol boat.

	1994	1995	1996	1997	1998	1999
Monitoring, control, surveillance	24571	31524	45213	43456	48754	34455
Research	23026	17107	17201	23075	23623	22244
Administrative and other costs	4481	5688	6877	7372	9992	9258
Total	52078	54319	69291	73903	82369	65957
landed value[1]	881300	945500	1250100	1254100	1686500	1760800
management cost as % of landed value	5.9	5.7	5.5	5.9	4.9	3.7

Table 11: Cost of fisheries management in N$ '000s and as a percentage of landed value. Capital costs spread over 10 year period. (adapted from Wiium & Uulenga, date?) [1] MFMR 1998b, MFMR 1997.

The costs of management can be presented as a percentage of landed value (Table 11, last row). However, in Namibia the landed value for hake is not one determined by the market but largely reflects the transfer prices within large, vertically integrated companies and must be treated with caution.

Throughout the last decade fisheries management has benefited from substantial donor funding. The data on donor contributions to the work of the MFMR, last published in the Ministry's Annual Report for 1998[15], shows that between 1995/6 and 1998/9 it ranged between N$30 million and N$ 36 million (MFMR, 1998b) per year. The reliability of these figure is questionable as difficulty has been experienced within the Ministry assembling these figures (Wiium & Uulenga, date?) and a recent paper estimates donor contributions in 1996 as being "just above N$39 million" (ibid.). It is also not clear what contribution donor funding has made to the normal, essential management expenditure of the Ministry and to what extent it could be considered expenditure addressing the pre-independence failures to provide adequately for education and training of a large part of the population.

[15] The Ministry has not published this data in its annual reports since the 1998 Report.

2.3.2 Revenues collected from the fishing industry – cost recovery

Apart from normal company taxation[16], revenue is collected from the industry in the form of quota fees, bycatch fees, the Marine Resources Fund levies, the Fisheries Observer Fund levies and licence fees. The fees applicable to the hake fishery were described further in Chapter 2, section 3.1. The revenue collected is summarised in Table 12 below and expressed graphically in Figure 6.

	1994	1995	1996	1997	1998	1999
Quota fees	108600	90600	45500	72200	75200	91100
Bycatch fees	9600	8000	14800	5000	6200	9000
licence fees	30	162	162	158	160	172
Marine Resources Fund levies[1]	8600	7200	6100	8300	9900	3300
Fisheries Observer Fund levies[1]	5000	5131	5438	5371	5799	6026
Total	131830	111093	72000	91029	97259	119598

Table 12: Receipts received by Government from the fishing industry in N$ '000 (source: Wiium & Uulenga). ([1] These levies are paid directly into the Marine Resources Fund and the Fisheries Observer Fund respectively.)

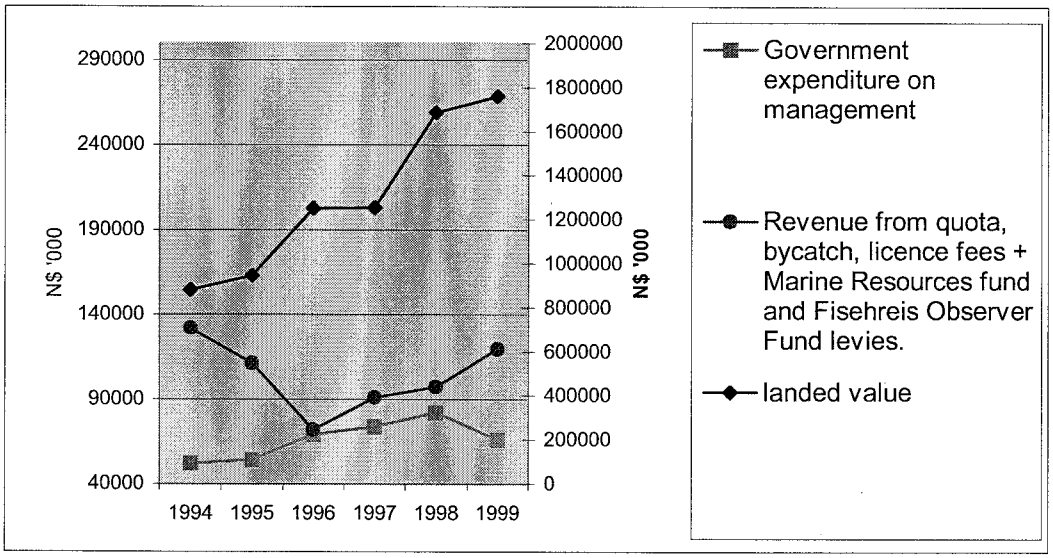

Figure 6: Expenditure and revenue raised in the Namibian Fisheries sector compared to landed value for all species. (Left-hand y axis: government revenue and expenditure; right hand y-axis: landed value. Note that if on the same scale the landed value would be very much steeper.)

Comparison is made between Government expenditure on the management of fisheries and the revenue collected by Government from quota, bycatch, and licence fees, and the levies paid into the Marine Resources Fund and the Fisheries Observer Fund.

The Namibian Government has clearly done better than most, if not all, other fishing nations in raising revenue from the fishing industry to cover the cost of management. The

[16] Data on company taxation is regarded as confidential.

fees paid to government constitute recovery of part of the resource rent available in the fisheries[17].

The above discussion is for the fisheries as a whole. However, revenue collected from the hake fisheries constitutes a substantial proportion of the total revenue raised from fisheries.

2.3.3 Revenue specifically from the hake fishery

For most of the 1990s the quota levy charged on Namibian hake remained static. In 1999 there was a 10 percent increase in quota fees and again in 2001 there was a further increase of varying percentages. By far the highest increases was for quota being utilised by foreign vessels, which rose by 64.8% for freezer trawlers and 81.8% for wet fish trawlers. The increase for "Namibian based vessels" and "Namibian vessels" was less than half that for foreign vessels as can be seen in Table 1. This indicates a strengthening of the incentive for fishing vessels to fly the Namibian flag and towards greater Namibian ownership and crewing of the vessels.

	Revenue from all fisheries N$ millions	quota fees collected for hake	fund levies collected for hake	Total revenue from hake N$ millions	Revenue from hake as a % of all revenue	average hake quota levy paid per tonne N$
1994	126.8	68.482	3.1	71.58	56.5	457
1995	106.1	63.5	2.6	66.10	62.3	423
1996[1]	67.6	34.2	2.4	36.60	54.1	201[1]
1997	85.6	55	2.0	57.00	66.6	458
1998	88.9	52.3	2.7	55.00	61.9	317
1999	113.5	67.9	2.8	70.70	62.3	323
2000	96.8					

Table 13: Revenue collected from the hake fisheries 1994 –1999. [1] Fishing was very poor in the hake fishery in 1996 due to the 'Bengeula Nino', which resulted in the catch being well below the TAC. Government collected the fees on catch and not quota for that year.

It must be emphasised that the data is not yet available that takes account of the 2001 increases in quota levies. However, because almost all vessels in the hake fishery now qualify as either Namibian or Namibian based, the increase in the revenue from quota levies can be expected to be about 32.5%. This assumes that about half the vessels are classified as Namibian based vessels and half as Namibian vessels in the case of both freezer trawlers and wet fish trawlers[18]. If the 1999 hake TAC of 210,000 tonnes were again used as an example, the actual revenue from quota levies collected would amount to about N$90 million (N$67.9 million, increased by 32.5%). Note that the annual revenue from the hake fishery was between 56% to 66% of the total revenue from the fisheries sector between 1994 and 1999.

[17] Some have argued that revenue needed to cover management costs is not part of the resource rent but rather part of the cost of fishing (ref).
[18] Assumed, as this information is not available.

However, when contrasted with the estimated rise in value of the hake catch (Figure 7) it becomes evident that the rate of increase in the total receipts from the industry have lagged behind the rate of increase of the estimated revenue.

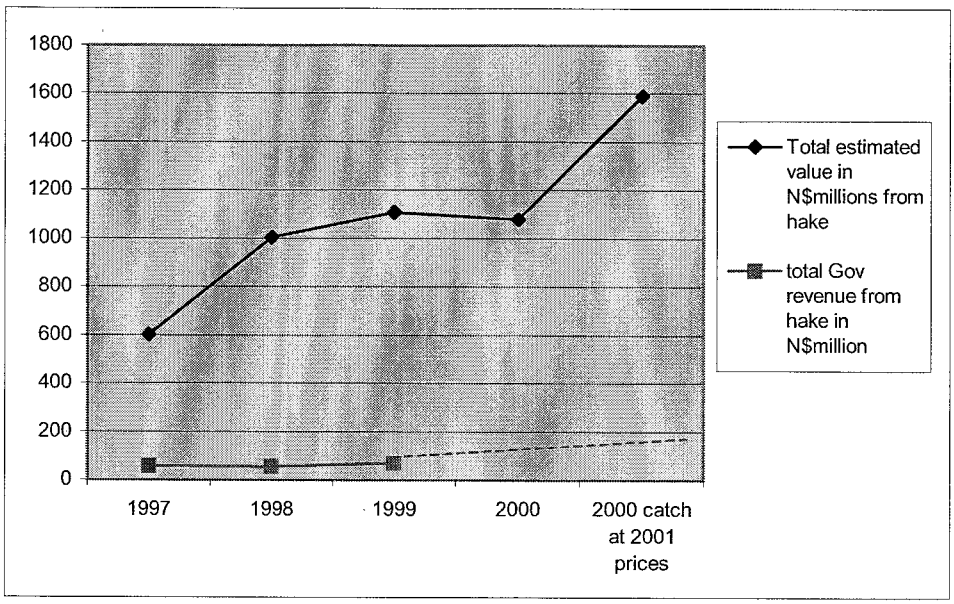

Figure 7: Total Government revenue from hake catch (Table 13) contrasted with total estimated value of hake catch calculated from size data and Globefish price data (Table 19, second row).

2.4 Fishing companies and social development expenditure

The fishing industry make contributions to "social development schemes". As part of the application process for rights of exploitation, companies were asked to indicate how they would extend the benefits the community gained as a result of the company being granted a right. It was made clear that their performance in doing so would be taken into consideration as part of the appraisal at the end of the period for which the right had been granted.

During the 11 years between 1990 and 2001, companies in the hake fishery are reported to have made contributions of N$16,472,599 to social development schemes (Iyambo 2002). N$16.4 million appears to be a large sum of money, but the significance of it needs to be considered in relation to the size for catch and its value. Between 1990 and 2000, some 1,272,858 hake was harvested in Namibia waters. The sum of N$16.4 million works out at a little over N$ 00.01per kg of hake harvested. The percentage of the rent going to social development schemes is minimal.

2.5 Catch sampling data used to establish price related size categories

The comprehensive catch sampling data for the hake fisheries is useful for establishing a product size profile for the catch.

The sampling of the hake catch, undertaken by the Ministry of Fisheries and Marine Resources since 1997, raised to the whole catch, provides the means of dividing the catch for each year into different size categories. The size categories used in this exercise, are those for headed and gutted Cape hakes frozen at sea and for the same product frozen on land.

In the sampling process undertaken on board the trawlers, the samples are measured, using intervals of 1 cm, between 10 cm and 102 cm in length, and the total mass of each particular size is recorded in kg. The sampling data is then raised to the whole catch, providing a size profile of catch. The total mass in each size category is divided by the number of individuals in that category, to obtain the average mass of each individual. By then applying the conversion factor of 1.46 for headed and gutted hake, it is possible to obtain the mass per piece of headed and gutted product. The mass of each of these 93 sampling sizes is then distributed into the size categories for headed and gutted frozen-at-sea hake (Table 14). The exercise is repeated for headed and gutted land-frozen hake (Table 15) used in the data published monthly in Globefish European Fish Price Reports.

These divides the entire catch into size categories used for headed and gutted frozen-at-sea (FAS) product and for land -frozen product. In reality, there are a variety of products (eg headed and gutted, and fillets, skin on and off) frozen both on land and at sea. In the absence of any data on the type or size of the hake products produced in Namibia, this data provides the basis for making calculations of the value of the hake catch, based on a basic product type, headed and gutted hake. The mass in each size category arrived at as a result of this exercise is given in Table 14.

grading	mass in each size category in kg FAS H&G			
gm/piece	1997	1998	1999	2000
<250gm/piece	8886998	5627695.2	8466834	7466656
250-350	15281216	12344563.9	9769679	14870312
350-550	21384034	32963454.3	23273150	25184352
550-680	8070281	12455640.8	11890997	9419071
680-750	4506294	7490192.35	7539044	5463073
750-950	8729222	14897038.7	13391411	10143023
950-1300	12999900	17526209.2	21834706	13800330
total h&g	79857945	103304795	96165822	86346816

Table 14: The mass of the Namibian catch in headed and gutted form given in size categories used by Globefish European Fish Price Reports for frozen-at-sea product (data source: Ministry of Fisheries and Marine Resources). Note that the largest size category used by Globefish is 950-1300 grams per piece. The substantial mass of fish larger than 1300 grams per piece are included in this size category as no price data is provided for sizes larger than 1300gms. This would have the effect of understating the value, as the larger fish attract higher prices.

The catch is divided into size categories used by Globefish for headed and gutted Cape hakes from Namibia landed wet and then frozen on land, which are different to the size categories used for FAS product. The mass in each size category is provided in Table 15.

	mass in each size category in mt landfrozen H&G			
	1997	1998	1999	2000
100-200 gr/pc	3262.15	2978.03049	4305.953	4058.823
200-350	20906.06	14994.2286	13930.56	18278.15
350-500	15436.88	23549.7809	15731.49	18531.32
500-700	16312.73	25696.5785	23326.1	18931.19
700-950	10940.22	18559.9669	17037.01	12747.01
950-1200	4996.236	8554.31251	8737.383	5895.096
1200-1500	3566.641	4388.67474	7092.405	3673.767
1500-2000	2956.575	2740.69167	4341.414	3180.609
> 2000	1480.449	1842.53024	1663.504	1050.859
total h&g	79857.95	103304.795	96165.82	86346.82

Table 15: The mass of the Namibian catch in headed and gutted form given in size categories used by Globefish European Fish Price Reports for land-frozen product from Namibia (data source: Ministry of Fisheries and Marine Resources; Globefish European Fish Price Reports).

The annual average price for each size category is calculated from the monthly price data published in Globefish European Fish Price Reports and summarised in Table 16. The prices are quoted in US$ in the Globefish European Fish Price Reports (see Appendix B) and the annual average exchange rate was used to convert them into Namibian dollars.

Product Form	Grading	Average price per kg in N$				
		1997	1998	1999	2000	2001
H&G – interleaved, FAS, ex coldstore Spain, from South Africa	<250 gr/pc	6.19	7.83	9.74	12.14	17.79
	250-350	6.61	8.44	10.50	12.66	18.48
	350-550	6.98	9.01	11.19	13.63	20.30
	550-680	7.46	9.77	12.41	15.44	22.80
	680-750	8.54	10.52	13.29	16.40	24.72
	750-950	9.25	11.37	14.07	17.42	26.10
	950-1300	10.38	12.83	16.24	19.70	29.16
H&G, IWP, landfrozen Spain fot - Namibia	100-200 gr/pc	5.72	7.20	8.12	9.14	13.76
	200-350	5.72	7.20	8.12	9.14	13.76
	350-500	6.18	7.79	8.54	9.50	14.29
	500-700	6.65	8.37	9.19	9.62	15.17
	700-950	8.04	10.12	10.78	11.28	16.69
	950-1200	10.05	12.66	12.96	12.77	18.75
	1200-1500	11.60	14.60	14.75	14.92	20.86
	1500-2000	13.14	16.55	16.39	16.97	23.24
	> 2000	16.23	20.44	20.30	20.47	25.62

Table 16: Average annual prices in N$ calculated from monthly price data for the Cape hakes published in Globefish European Fish Price Reports. Note that the price data for headed and gutted frozen-at-sea product is reported for South Africa; none is reported for Namibia, so the SA data are used. The average annual exchange rates of N$ to one US$ used are: 1997 - 4.6073; 1998 - 5.5316; 1999 - 6.1131; 2000 - 6.9353; 2001 - 8.6031(SA Reserve Bank). These were applied to the US$ prices in Appendix B.

In the absence of prices for Namibian headed and gutted, frozen-at-sea product, the Spanish ex-coldstore price data for the South African product is used. This should be very close to the price of the Namibian product as it is the same species, fished in the same ecosystem using the same techniques with a similar cost structure to that of Namibia.

The headed and gutted, land-frozen product prices are the "free on truck" (fot) prices in Spain. This includes all loading, discharging and sea-freight costs and the costs of placing goods onto trucks at the quay. The costs of coldstorage in Spain and of transfer

from port to coldstore are not included when comparing them to the ex-coldstore prices. However, these should be relatively minor costs.

The value of the whole catch frozen at sea and the value of the whole catch land-frozen are calculated (Table 17). These values are a broad measure of the value of the catch if the whole catch were frozen at sea and, alternatively , if it were all land-frozen. The catch is not all sold as headed and gutted product but fishing companies produce a mix of products, which they judge to be optimum, in order to maximise their profits. If headed and gutted product were the optimum product, then presumably the fishing companies would choose to produce all headed and gutted product. The assumption thus can be made that the value of the catch arrived at in this way understates its real value, as fillets involve greater value adding.

value in N$ millions in each size category FAS H&G if all frozen at sea					
gm/piece	1997	1998	1999	2000	2000 catch at 2001 prices
<250	54.996883	44.090292	82.487626	90.621126	132.8087365
250-350	101.03653	104.15975	102.60129	188.29833	274.8379588
350-550	149.19526	296.92372	260.42437	343.35449	511.1453044
550-680	60.207421	121.72459	147.61071	145.45495	214.7379955
680-750	38.475868	78.77498	100.20343	89.605236	135.0448327
750-950	80.747753	169.33863	188.44689	176.68296	264.6930364
950-1300	134.91702	224.91423	354.61554	271.81478	402.47985
total h&g	619.57674	1039.9262	1236.3899	1305.8319	1935.747714
average price/kg	7.7584859	10.066582	12.856853	15.123104	22.418287
value in N$ millions in each size category landfrozen H&G if all landfrozen					
gr/piece	1997	1998	1999	2000	2000 catch at 2001 prices
100-200	18.662226	21.454105	34.949688	37.109967	55.86953297
200-350	119.60015	108.0203	113.06876	167.11776	251.597939
350-500	95.472241	183.41143	134.41912	175.96568	264.7813736
500-700	108.45582	215.14105	214.41895	182.06029	287.1886622
700-950	87.960422	187.91441	183.58927	143.73068	212.7477192
950-1200	50.212749	108.26249	113.27644	75.261103	110.5610922
1200-1500	41.359791	64.087627	104.58851	54.80038	76.64401988
1500-2000	38.85667	45.358495	71.153617	53.988122	73.90316253
> 2000	24.034797	37.668945	33.77197	21.511811	26.92605274
total h&g	584.61487	971.31885	1003.2363	911.5458	1360.219554
average price/kg	7.3206851	9.4024566	10.432358	10.556797	15.75
%difference in average prices	**6.0**	**7.1**	**23.2**	**43.3**	**42.3**

Table 17: Value of the catch in millions N$ calculated on the bases of whole catch being frozen at sea and whole catch being landed wet and frozen on shore. Calculated using price data in Table 16 and the mass in each size category in Table 14 and Table 15.

Fishing companies in Namibia are not totally free to produce whatever product mix they deem to be optimum as the total allowable catch is allocated on the basis of quota to be frozen at sea and quota which must be landed wet and frozen on shore. The percentage which can be frozen at sea has been diminishing and, conversely, the percentage of the TAC that must be landed wet has been rising steadily so that in 2001 it had reached 59.9%. In Table 18 the value of the production, using the values generated in Table 17, are used but reflecting the value of the proportion for each year that must be landed wet and that which may be frozen at sea.

	1997	1998	1999	2000	2000 catch at 2001 prices
Value of catch if all FAS N$ mil	619.577	1039.926	1236.39	1305.832	1935.748
% of quota landed wet	51.7[1]	53.2[1]	55.2[3]	57.1[3]	59.9[2]
value of % FAS N$mil.	299.256	486.685	553.903	560.202	776.235
value of % landfrozen N$mil.	302.246	516.742	553.786	520.493	814.7715
total N$m	601.501	1003.427	1107.689	1080.695	1591.006
Average value per kg (nominal mass) for % FAS	5.31	6.89	8.81	10.36	15.35
Average value per kg (nominal mass) for % landfrozen	5.01	6.44	7.15	7.23	10.79
value per kg of headed and gutted product	7.53	9.71	11.52	12.52	18.42577

Table 18: Values of whole catch if landed as frozen-at-sea, headed and gutted product, compared to value of whole catch with the relevant proportions land-frozen and sea-frozen. ([1] Namibia Brief 1998; [2] Fishing Industry Handbook 2001; [3] Not available; estimate assuming equal increments between 1998 to 2001).

The difference between the value if the whole catch was frozen at sea[19] and the value with the percentage increasing to 60% landed wet for onshore processing and 40% frozen at sea is given in Table 19 and presented graphically in Figure 8. This shows that the loss in revenue in current Namibian dollars, has risen from N$18 million in 1997 to N$225 million in 2000, and to N$345 million in 2001 if 2001 prices are applied to the 2000 catch.

	1997	1998	1999	2000	2001[1]
Value of production if frozen at sea N$ million	619.577	1039.926	1236.39	1305.832	1935.748
Value of production with % land-frozen/ % FAS - N$ mil.	601.501	1003.427	1107.689	1080.695	1591.006
Cost of policy in lost revenue N$ million	18.076	36.499	128.701	225.137	344.742

Table 19: Calculation of the value of lost revenue. ([1]2001 prices applied to 2000 catch).

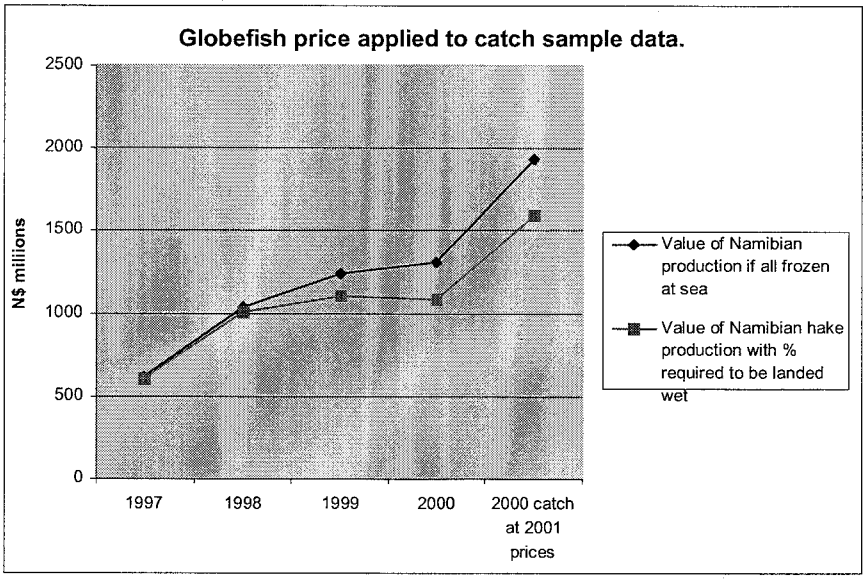

Figure 8: Comparison of value of production if whole catch were frozen at sea and, alternatively, that value if the policy prescribing a percentage to be landed wet for onshore freezing.

[19] If the whole of Namibia's hake production was frozen at sea, FAS prices would probably fall (or not rise as steeply) and onshore frozen product prices would probably rise.

This difference is a rough measure of the loss of revenue as a result of the policy to land fish wet for onshore processing.

These calculations take account of the size structure of the Namibian hake catch and its mass from year to year. It is not simply the changing percentage of the TAC allocated for freezing at sea and onshore freezing that is accentuating the gap in revenue evident in Figure 8. The difference in average price between the frozen-at-sea, headed and gutted Cape hake and the land-frozen product has risen from 6% in 1997 to 42% in 2001 (Table 17, last row).

It is difficult to be sure why the gap between the price received for frozen-at-sea product and land frozen product has been increasing to such an extent. In recent years the supply of hake to the European market from Argentina has markedly decreased and the supply from Namibia to the European market has become more significant. It is possible that by imposing an increase in the supply of land frozen product and the decrease in supply of frozen-at-sea product to the European market, that the Namibian policy has put upward pressure on the frozen-at-sea prices and downward pressure on the price of the product landed wet and frozen onshore. Further scrutiny of these aspects of the market would be needed to establish whether the Namibian policy is a significant factor in these price movements.

The lower level of revenue is not the only cost involved in the policy. The unit cost of onshore processing is higher than the cost of producing the same product at sea. However, quantifying this would require additional data which is not available at this point[20].

By establishing individual quotas, the incentive is created to minimise costs (and maximise profits) rather than race to catch fish before others do so. It is interesting to note that in the Icelandic cod fisheries, where a similar incentive structure exists, but where there is no restriction on freezing at sea, fishing effort had decreased by about one third in 1997, but gross tonnage has not been reduced significantly as there has been a shift from land to sea processing (Arnason, 1994, and private communication with author). Effort has decreased, according to Prof. Arnason, because fishing companies have sought to adjust effort to the quota they have available to them to catch and so minimise costs. However, at the same time, gross tonnage has apparently increased to accommodate processing plant on board vessels as land-based processing has been transferred to sea.

2.6 Rent spent on employment creation

The principal reason that the Government insists on landing 60% of the hake catch wet for onshore processing is to maximise the number of jobs available in the fishing industry. The social desirability of this policy objective is obvious in a country where unemployment as a percentage of the economically active population runs at about 35% (Labour Force Survey 1997). It is understandable that the fishing industry, based as it is

[20] Cost of landing wet and processing onshore was claimed to be 38% higher than processing at sea by an executive of a Namibian fishing company in 1995 (Manning 1998).

on Namibia's most valuable natural renewable resource, has been seen as providing a major opportunity for job creation. The importance of this to the Government is evident from the emphasis given to employment in the Annual Reports of the Ministry.

Examination of what happens to resource rent and to the dissipation of potential rent requires examining this implications of the policy on employment creation in the fishing industry. It is important to consider the cost of the policy and the extent to which it may or may not be the best means of achieving higher levels of employment. In essence it involves the dissipation of resource rent of considerable value. Governments have every right to allocate resource rent for the purpose of achieving social objectives. It makes sense, nevertheless, for Governments to achieve the best possible outcome through the use of resource rent spent on employment creation.

2.6.1 Number of additional jobs in the hake fishery

Data on employment in 1999 on vessels in the hake fishery was extracted from the Register of Fishing Vessels held by the MFMR. This is summarised in Table 20. As this calculation is aimed at estimating the numbers of jobs, and not nationality or gender, the totals are the relevant figures to consider. Note that 935 people working on freezer trawlers caught and processed 73665 mt of hake[21].

employed at sea in the hake fishery			
	Namibian	Foreign	Total
Wet fish trawlers	836	183	1019
Longline -wet	292	28	320
Freezer Trawlers	678	257	935

Table 20: Summary of employment data in the hake fishery extracted from the Register of Fishing Vessels, MFMR, Windhoek for 1999.

Numbers employed specifically in the hake fishery is not available. Data on numbers employed onshore in the demersal fisheries is published but the latest available was for 1998 (Annual Income and Expenditure Report for 1998). These are used, as they do not now differ greatly from year to year. In order to allocate the jobs on shore to the hake fishery in particular, the numbers employed were allocated in proportion to hake catch as a percentage of the demersal catch[22]. This was 89.9% in 1999. As processing of the fish landed wet takes place onshore, the assumption was made, for the purpose of this exercise, that 75% of managerial, clerical and secretarial jobs allocated to hake were occupied with the wet fish part of the fishery. It is also assumed that 5% of workers jobs onshore are devoted to dealing with the freezer trawler catch, leaving 95% of the workers jobs devoted to the wet fish catch.

[21] The exact catch taken by freezer trawlers is not publicly available so this estimate is arrived at by dividing the actual catch in proportion to the share of the quota allocated for freezing at sea.

[22] Deepsea demersal species such as orange roughy and alfonsino are not included as they are regarded as species of the deepwater fishery.

employed on shore in demersal fisheries (1998)					
	Namibian	Foreign	Total	Employed onshore in hake fishery(89.9% of total)[1]	Employed on onshore in wet fish hake
managerial, clerical/secretarial	320	25	345	310	233
workers	2822	4	2826	2541	2414
					2647

Table 21: Allocation of jobs to the wet fish part of the hake fishery.

This means that there are 2646 onshore jobs in the wet fish part of the hake fishery. Thus the number of jobs in the wet fish part of the hake fishery, including those at sea, would be 3665 (2646 + 320 + 1019) involved in the harvesting and processing of the wet fish catch estimated for 1999 at 90765 mt. However, had the wet fish quota been caught and processed by freezer trawlers, it would have involved employing about 1152 people (935÷73665 x 90765). Thus the additional jobs created in the hake fishery as a result of the policy to land fish wet is about 2513 (3665-1152) persons in 1999.

2.6.2 The cost implications of these additional jobs

These jobs appear to have been created at considerable cost.

Fishing companies would prefer to received the more lucrative freezer quota that the wet fish quota and would have been prepared to pay the additional N$220 per mt, as it was in 1999. Cost in revenue not collected by the Government by charging wet fish quota levy and not freezer levy in 1999 come to N$25.5million (220[23]×115920[24]) or N$10147 per extra job created.

The cost in lost revenue should also be considered. From Table 19 we know that the estimate of revenue lost in 1999 as a result of the policy is N$128.701million, or N$51214 per extra job created. (If there were the same number of jobs in 2000, then they would have cost N$ 225.137 million in lost revenue, or N$89 589 per extra job.)

GDP per capita in Namibia is about N$12500 pa (National Accounts 1993-2000). Forfeiting these additional quota levies and loosing potential revenue on this scale seems an expensive way of creating additional jobs. This policy needs careful re-evaluation. Instead of putting a resource rent subsidy into job creation in the fishing industry, consideration should be given to collecting up the additional rent through the quota levy and using it instead to subsidise jobs, of example, in the building of houses or schools. It should be possible in that way to create at least as many jobs as in the fishing industry but with the advantage of producing a better fish product, more favoured by the market and attracting better prices, and in addition have more houses or schools.

[23] See Table 1. Note that this figure rose to N$250 per tonne in 2001.
[24] Wet fish portion of the TAC for 1999.

3 Conclusion

The data used in this analysis is often for very short periods of only two or three years. In addition, one set of data may not correspond to the years covered by another set of data. These inadequacies and the assumptions that needed to be made, mean that these finding cannot be regarded as doing much more than raising question that deserve further investigation and verification. The Government does well in covering the costs of management. Rent of considerable value is accruing to the industry in Namibia, but it also appears that there could be rent accruing abroad. If would also appear that the policy of insisting that 60% of the hake quota must be landed wet for onshore processing is very costly in terms of the loss of revenue, and therefore of potential rent.

Chapter 4

Resource Rent and the South African hake fisheries.

1 Size distribution and product composition of landings

Data reflecting some detail of hake products for South Africa were supplied for the deep-water and inshore hake fisheries for the years 1997 and 1998. No data of this sort was available for the longline fishery.

A breakdown of the size categories of the portion of the catch landed as headed and gutted product for the deep-water and inshore hake trawl fisheries was provided for 1997 and 1998.

	1997				1998			
product	nominal catch tonnes	landed mass tonnes	landed price R/kg	Landed value R'000	nominal catch tonnes	landed mass tonnes	landed price R/kg	Landed value R'000
hake 5	17178	11766	4.39	51594	18578	12725	4.61	58599
hake 4	20817	14258	4.39	62521	22469	15390	4.61	70871
hake 3	18351	12569	4.20	52828	17218	11793	4.41	52043
hake 2	14795	10134	3.41	34597	16415	11243	3.59	40306
hake 1	21273	15750	2.26	35532	21281	15368	2.37	36422
hake 6	14857	10176	1.85	18836	21693	14858	1.94	28869
hake 0	3905	2819	1.85	5218	3538	2424	1.94	4710
broken	917	628	2.90	1821	1009	691	3.05	2104
landed Fr/wet	112093	78100	3.37	262947	122201	84492	3.48	293923
fillets (skin on)	5383	2775	6.50	18038	4347	2241	6.83	15295
Fillets (skin off)	16667	7408	7.00	51856	16055	7136	7.14	52450
All hake	134143	88283	3.77	332841	138419	93869	3.85	361668

Table 22: Nominal catch, landed mass and landed value, for deep-sea trawl fishery, 1997 and 1998 (MCM).

Table 22, above, provides details of the hake catch for the deep-water trawl fisheries in 1997 and 1998. More particularly, it provides the nominal catch, landed mass and landed value of the catch by size category. Similarly Table 23 provides these details for the inshore trawl fishery.

It would appear that 83.6% in 1997 and 88.3% in 1998 of the nominal catch in the offshore trawl fishery and 100% of the nominal inshore trawl catch was landed in headed and gutted form. This is deduced from Table 22 and Table 23 because the landed mass given has been multiplied by 1.46, the conversion factor[25] used to convert headed and gutted hake to whole fish equivalent, and thus to obtain the nominal catch. According to this data, the remaining 16.4% (1997) and 11.7% (1998) of the nominal deep-water catch were landed as fillets. However, neither the size categorisation for fillets is provided nor

[25] Other conversion factors used in South Africa for hakes are: head-on gutted – 1.10; untrimmed skin-on fillets - 1.94; trimmed skinless – 2.25; and longlined – 1.10 (FIH 2001).

the precise product form, such as skin-on or trimmed, skinless fillets. The focus of this examination, therefore, will be on headed and gutted part of the hake catch.

	1997				1998			
product	nominal catch tonnes	landed mass tonnes	landed price R/kg	Landed value R'000	nominal catch tonnes	landed mass tonnes	landed price R/kg	Landed value R'000
hake 5	932	638	4.385	2798	1031	708	4.605	3260
hake 4	2091	1432	4.385	6279	1024	701	4.605	3228
hake 3	2097	1436	4.203	6036	1645	1127	4.413	4973
hake 2	1942	1330	3.414	4541	1652	1131	3.585	4055
hake 1	1283	898	2.256	2026	2011	1408	2.37	3337
hake 6	285	195	1.851	361	496	339	1.943	659
broken	279	192	2.9	557	432	297	3.045	904
all hake	8909	6121		22598	8291	5711		20416

Table 23: Nominal catch, landed mass and landed value, for inshore trawl fishery, 1997 and 1998 (MCM).

The size categorisation used in the above tables is further explained in Table 24 below. The proportions of catch landed as frozen or wet product is not provided[26].

small zero system - hake size catagories			
product	length H&G mm	sea frozen in gms	Wet, in gms
hake 5	600-680	1500-2400	1200-1800
hake 4	500-600	800-1500	620-1200
hake 3	450-500	500-800	420-620
hake 2	400-450	350-500	290-420
hake 1	350-400	250-350	200-290
hake 6	300-350	150-250	130-200
hake 0	150-300	80-150	80-130

Table 24: The small zero system for hake size categorisation used in South Africa (FIH 2001).

For purposes of re-categorising the catch from the South African product sizes into those used on European market (Globfish European Fish Price Reports, 1997-1998), where the ex-coldstore prices are given for frozen product, the mass in grams for sea-frozen headed and gutted hake is used. It is also assumed that the catch is evenly distributed within each size category.

1.1 Note on the longline fishery

Neither the mass nor value was given for the hake longline catch for 1997. The longline catch for 1998 is reported as 2406 tonnes, with a landed value of R14.147million (Fishing Industry Handbook, 2001), which gives a per kilogram value of R7.00. No data on product form was provided, indicating, *inter alia*, what part of this catch was exported fresh. The average per kilogram price for fresh/chilled hake from South Africa in the European Union in 1998 was R20.20 (3.24)[27] (Eurostat database COMEXT) and the average March 2002 price is ZAR85.16 (8.30)[28] per kilogram Globefish 2002. It should

[26] Frozen at sea product tends to fetch significantly higher prices.

[27] 3.24 converted using the 1998 average exchange rate of 1Euro = R6.201 (SA Reserve Bank).

[28] 8.30 converted using January 2002 exchange rate of 1= ZAR10.26 (SA Reserve Bank).

be noted that the current import tariff into the European Union for fresh hake from South Africa remains 15 percent.

2 Comparison of the landed price with the ex-coldstore price for headed and gutted Cape Hakes in Spain

Market prices for Cape hakes in Spain are an important guide to the prices that can be expected on international markets. The European Union market is the major global market for hake and hake products (Alheit et al, 1995). By far the most dominant hake market within the European Union is that of Spain (ibid). Thus the prices achieved on the Spanish market can be considered an important indicator of international prices for hake. Although we know from Eurostat data (see Appendix B) that for 1997 and 1998 respectively an estimated 30.7% and 31.3% of South Africa's nominal hake catch was sold on the European market, it is useful to examine what value would be realised if the whole of the catch was sold on this principal international market for hake.

Thus a comparison is made of the South African landed price for Cape hakes with that of the ex-coldstore price for Cape hakes on the Spanish market. Adjustments to the revenues accruing in Spain need to be made in order to make them comparable to the landed price in South Africa. This can be done by subtracting the transportation and related costs and EU import duties. The resulting set of prices should be fairly similar to the South African landed values. The adjusted Spanish prices could be marginally higher due to relatively minor charges for cold storage and sale. As there is no further value adding to the product landed, there should not be a significant difference in price between the landed price for headed and gutted hake and the wholesale price[29].

2.1 Comparing the prices

Globefish European Fish Price Reports provide the monthly ex-coldstore prices in US$ by size category for headed and gutted Cape hakes (Table 25).

Globefish size categories/prices for Cape hakes				
gm/pc	1997 average price US$/kg	1998 average price US$/kg	1997 average price R/kg	1998 average price R/kg
950-1300	2.32	2.31	10.68	12.78
750-950	2.06	2.05	9.51	11.32
680-750	1.90	1.89	8.77	10.47
550-680	1.67	1.76	7.71	9.72
350-550	1.57	1.62	7.21	8.97
250-350	1.49	1.52	6.85	8.40
<250gm/pc	1.39	1.41	6.40	7.80

Table 25: Globefish size categories and average Spanish ex-coldstore prices for Cape hakes (Globefish European Fish Price Reports). (Average US$-South African Rand exchange rates for 1997: US$1 = R4.6073; for 1998: US$1 = R5.5316 (South African Reserve Bank)

[29] The wholesale value for the whole demersal catch was provided, but not the value specifically for hake.

Note that the size categories are different to those used in South Africa. As the month of the sale of product is not known, the average annual price of each size category is used for years 1997 and 1998. The US$ prices are then converted using the average exchange rate for each year provided by the South African Reserve Bank. Note also that there is a South African size category larger than the largest size category given for ex-coldstore prices in Spain. In previous years Globefish European Fish Price Reports quoted prices for fish larger than the largest category in Table 25, and these fetched higher prices than the largest size category given below.

In Table 26 the landed mass of headed and gutted hake for both the deep water and the inshore trawl fisheries for 1997 and 1998 are re-categorised according to the size categories used by Globefish. This has been done on the basis of an assumption that the fish are evenly distributed within each South African size category. Note also that the relatively small quantities of the broken fish (Table 22 and Table 23) have been ignored.

gm/pc	1997 mt deepwater	1997 mt inshore	1997 total	1998 mt deepwater	1998 mt inshore	1998 total
950-1300	22968.71	1763.14	24731.85	24817.14	1258.79	26075.93
750-950	5150.12	546.19	5696.31	5263.36	338.05	5601.41
680-750	2932.77	335.07	3267.84	2751.7	262.97	3014.67
550-680	5446.57	622.27	6068.84	5110.3	488.37	5598.67
350-550	12228.83	1569.33	13798.16	13208.5	1318.83	14527.33
250-350	15750.00	898.00	16648.00	15368	1408.00	16776.00
<250gm/pc	12995.00	195.00	13190.00	17282	339.00	17621.00

Table 26: Catch redistributed according to Globefish size categories.

By applying the prices received for the different size categories in Spain, converted into South African Rands (Table 25), to the catch redistributed according to size categories as in Table 26, it is possible to calculate the ex-coldstore values that would be expected in Spain for the headed and gutted hake landed in South Africa in 1997 and 1998. These values are given in Table 27.

size categories	1997			1998		
	offshore	inshore	total	offshore	inshore	total
950-1300	245246.56	18825.81	264072.37	317227.71	16090.56	333318.27
750-950	48978.85	5194.40	54173.25	59588.27	3827.15	63415.42
680-750	25729.36	2939.56	28668.92	28819	2754.09	31573.09
550-680	41969.66	4795.01	46764.67	49681.25	4747.80	54429.05
350-550	88222.01	11321.58	99543.59	118485.70	11830.48	130316.18
250-350	107819.43	6147.42	113966.85	129143.82	11832.02	140975.84
<250gm/pc	83172.02	1248.06	84420.08	134871.56	2645.61	137517.17
total	641137.89	50471.84	691609.73	837817.31	53727.71	891545.02

Table 27: Values in '000 South African Rand for 1997 and 1998 for headed and gutted portion of the hake catch using ex-coldstore prices in Spain.

In order to make the prices comparable, it is necessary to consider transportation and other related costs, and import duties charged on the headed and gutted Cape hakes from South Africa entering the European Union. An estimate of the per kilogram charge for

transport to Spain and other related services was R2.17 in 1997 and R2.39 in 1998[30]. If these charges are applied to the landed mass of headed and gutted hake for 1997 (83401 tonnes) and 1998 (89215 tonnes)[31], then total charges of R180.98 million for 1997 and R213.22 million for 1998 would apply. The cost into coldstore in Spain also includes the import tariffs, which for 1997 was 8.9% and for 1998 was 7.6% of the cost delivered to the importing harbour (TARIC). These are calculated as R41.309 million for 1997 and R39.866 million for 1998. The sum of transport and associated costs, import tariffs, and the landed value of the headed and gutted portion of the hake catch gives the total costs of importing the headed and gutted catch into Spain as R505.456 million for 1997 and R564.422 million for 1998. This is summarised in Table 28 below.

Costs into coldstore of H&G hake based on the SA landed value in millions Rand		
	1997	1998
Total landed value in SA	283.167	311.332
transport and associated costs	180.98	213.224
Total before tariffs	464.147	524.556
Import tariff[1] to EU	41.30908	39.86626
costs into coldstore in Spain	505.4561	564.4223

Table 28: Cost of importing headed and gutted catch into Spain, based on landed values in South Africa, making adjustments for transport costs and tariffs. ([1] Import tariff for frozen headed and gutted hake from South Africa into EU was 8.9% in 1997 and 7.6% in 1998. (TARIC))

A substantial difference exists, of R186.154 million in 1997 and R327.123 million in 1998, between the South African landed prices, adjusted for transport and related costs and import duties into the EU and the ex-coldstore prices in Spain. This difference is reflected in Table 29 below.

	1997 million ZAR	1998 million ZAR
Total H&G value ex coldstore Spain in SA Rands	691.610	891.545
Costs into coldstore in Spain	505.456	564.422
Difference between Spanish and South African prices	186.154	327.123

Table 29: Difference between the ex-coldstore price in Spain and the South African landed value, adjusted to take account of transport and associated costs and import duties.

2.2 A comment on these values

The above exercise serves to indicate the value of South Africa headed and gutted hake product on the principal global market for hake. It does not indicate values actually achieved as these are not known for the entire headed and gutted hake product.

It might be argued that the South African landed price for headed and gutted hake is not the relevant price with which to make the comparison and that it is the wholesale price

[30] The cost of transportation and related services were provided for the years 2000 to 2002 inclusive by the Deep Sea Trawling Association through MCM. These costs rose by 10.83% in 2002 over costs of the previous year and by 11.77% in 2001 over costs in 2000. Price increases over the previous three years are estimated, therefore, at 10 percent per year.

[31] Landed mass, deepwater and inshore, for 1997 and 1998, excluding broken hake.

for this product that ought to be used. Apart from the problem that the wholesale price for headed and gutted hake was not available[32], there ought not to be a significant difference between the landed price for headed and gutted hake and wholesale price for headed and gutted hake, as no value-adding takes place. While the landed price for hake in South Africa is a transfer price within large, vertically integrated companies, it is presumably also used by these companies in determining the value of landings of hake harvested on behalf of other quota holders. It is reasonable, therefore, to assume that landed price covers all costs. If the wholesale value is significantly different without value-adding, therefore, then this difference must in large part reflect a share of the resource rent.

It cannot be assumed, therefore, that the differences in value, reflected in Table 29 above, are accruing outside of South Africa in part or in whole. This is explored more fully in sections 2.3 and 2.4 below.

2.3 The impact of rising international prices and the fall in the value of the Rand

The data used above reflects the situation in the latter part of the 1990s. However, since 1998 there have been significant changes in prices. The average US dollar prices for all size categories in March 2002 were 67.85% higher than the average for 1998. When the changes in the SA Rand/US$ exchange rate[33] are considered, then the price increase during this period in terms of SA Rands is 252%. The import duties into the EU for frozen headed and gutted hake have also been reduced to 4%.

In order to illustrate the impact on the anticipated revenues of fishing companies in the hake sub-sector, of the US dollar price increases for headed and gutted Cape hake, coupled with the changes in the US dollar/South African Rand exchange rates, and the lower import duties that now apply, the hypothetical exercise above could be extended.

TAC for 1998 allocated to trawl (1998) mt[1]	148500
trawl catch inshore and deepsea in 1998 mt[1]	145870
actual trawl catch as % of TAC 1998	98.23
quota trawl allocations for 2002 mt[2]	145870
apply % catch for 1998 to obtain estimate of 2002 catch-mt	143288.1
assume % landed in H&G form same as 1998 (88.3%) –nominal mass -landed mass	126523.39 86659.858
	ZAR millions:
value of estimated 2002 h&g hake product ex-coldstore Spain	2987.000
EU import duties	59.740
transport and related costs	310.242
Sum transport and related costs and import duties	369.982
Residual value (estimated value *less* import duties and transport costs)	2617.018

Table 30: Estimation of expected value of headed and gutted portion of the 2002 hake catch using March 2002 Spanish ex-coldstore prices. For further detail of the calculation used in estimating above see Appendix C, Table A 5.

[32] The wholesale value of the whole of the demersal catch was provided.

[33] Average monthly exchange rate for March 2002:US$1 = ZAR11.494. (SA Reserve Bank). However, the Rand has since appreciated against the dollar; the current rate (13/05/02) is R10.3063.

Suppose that the percentage of the TAC landed as headed and gutted product in 2002 is the same as it was in 1998, then it should be expected that 86659.858 tonnes will be landed as headed and gutted hake product in 2002. If the percentage of the catch in each size category is the same as it was in 1998, and average Spanish ex-coldstore prices for March 2002[34] are applied, then the Spanish ex-coldstore value for the 2002 headed and gutted portion of catch would be R2987.000million. The detail is presented in Table 30.

Transport and related costs have increased to R3.58 per kg in 2002 (see Appendix C, Table A4), producing a bill of R310.2423 million. A difficulty arises because we do not know the landed value of the 2002 catch. For purposes of calculating import duties, we make the generous assumption that the landed value for 2002 is 50%[35] of the Spanish ex-coldstore value. Based on this assumption, with the import tariff into the EU for headed and gutted hake from South Africa now reduced to 4%, import duties paid on the 86659.858 tonnes would be R59.74million. The total transport and associated costs and the import duties would then amount to R369.9823 million.

This leaves a residual value of R2617.018million. If the headed and gutted portion of the 2002 catch turns out to be approximately of the mass and size composition as described above, then this should roughly approximate the landed value, which in turn should not be very different from the wholesale value, of the landings of headed and gutted hake for 2002. If the actual landed value falls significantly short of this value then there is a prima facie case that substantial rent is being collected somewhere between when the product is landed and when it leaves the coldstores in Spain or elsewhere.

2.4 Exploring values using Eurostat import data

Using Eurostat import data (COMEXT), it is possible to examine more closely the export of headed and gutted hake to European Union for 1997 and 1998.

The total landed mass and value for headed and gutted hake for the years 1997 and 1998 is extracted from Table 22 and Table 23 above, and the average per kilogram landed value for headed and gutted hake is calculated.

	total landed massof h&g hake mt	total landed value ZAR '000	average landed value per kg
1997	83401	283167	3.395247
1998	89215	311332	3.489682

Table 31: Calculation of average landed value per kg for headed and gutted hake for 1997 and 1998 (Appendix C, Table A 6)

Using Eurostat data in Table 32, the per kg average import value into the European Union for headed and gutted hake is first derived. EU customs code 03037811 refers to frozen

[34] Globefish European Fish Price Reports, 15 March 2002 - No. 03/2002

[35] Landed value as a percentage of the ex-coldstore Spanish price was only 41% for 1997 and 38% for 1998.

Cape hake products which are not fillets or other fish meat products[36]. In the case of hake products exported from South Africa this would almost all be headed and gutted hake. Transport and associated costs are deducted from the import value to give the export value from South Africa (final column of Table 11).

Frozen hake, not fillets, mass and value – code 3037811							
	value '000 Euro	mass mt	Value euro/mt	exchange rate euro/ZAR	import value into EU per kg in ZAR	transport &associated costs ZAR/kg	export value ZAR/kg derived from EU import figures
1997	18951	11888	1594.1285	5.21	8.3046126	2.17	6.13
1998	17800	11205	1588.5765	6.20	9.8507631	2.39	7.46
1999	21070	11838	1779.8615	6.52	11.604697	2.63	8.97

Table 32: Deriving export value from SA from EU import figures for hake (Eurostat database, COMEXT). Eurostat data see Appendix Table A 1 and Table A 2.

If the average landed value per kg is compared with the export value from South Africa derived from the EU import figures, the percentage mark-up on the landed price, without value adding, was 80.29% in 1997 and 113.75 percent in 1998 (Table 33). This suggests that resource rent of approximately the value of the mark-up accrued to the exporters. If these values are applied to the landed mass for the two years (Table 31) then the value of the rent accruing would be R227 684 730 (2.73x83401x1000) for 1997 and R354 183 550 (3.97x89215x1000) for 1998. We know that some of this is passed on in the form of payment to the holders of paper quotas. However, in 1997 and 1998 Irvin & Johnson and Sea Harvest between them enjoyed the benefit of over two thirds of the hake quota, including resource rent associated with it.

	export value ZAR/kg derived from EU import figures	average landed value per kg	balance reflecting markup	% mark-up from landed price
1997	6.13	3.40	2.73	80.29
1998	7.46	3.49	3.97	113.75

Table 33: Comparison of value of exports from South Africa with the average landed value and calculation of mark-up.

Assuming that the size composition of the exports to the EU of frozen headed and gutted hake reflects the size composition of the landed mass, then it is possible to compare the estimated ex-coldstore value of the imports of headed and gutted hake in 1997 and 1998, with the import value reflected in the Eurostat import data (Table 34). There should be very little difference between the two figures as, apart from relatively minor charges for cold storage, there has not been further value-adding in the EU at this point. The product remains headed and gutted frozen hake.

[36] Heading 0303: "Fish, frozen, excluding fish fillets and other fish meat of heading 0304". Heading 0304 reads "Fish fillets and other fish meat (whether or not minced), fresh, chilled or frozen" (Taxation and Customs Union database).

	Headed and gutted frozen hake product						
	mass in mt imported into EU	import value Euro '000 using Eurostat data	Euro/ZAR average exchange rate for the year	total h&g landings mt	ex-coldstore Spanish value of total landings ZAR millions	value of actual imports using ex-coldstore values –ZAR millions[1]	value in millions ZAR of EU imports using Eurostat data
1997	11888	18951	5.21	83401	691.61	98.58	98.73
1998	11205	17800	6.20	89215	891.545	111.97	110.38

Table 34: Value of actual imports of Cape hakes in frozen form, excluding fillets, derived from Eurostat data and from the ex-coldstore Spanish prices published monthly in Globefish European Fish Price Reports. ([1] (mass imported÷total h&g landings) x ex-coldstore value of total landings).

When the figure for the value of actual imports, using the average ex-coldstore (Spanish) prices for headed and gutted Cape hake, the value of the hake actually imported is ZAR98.58 million. The import value, reflected in the Eurostat data, converted into South Africa Rands, is ZAR98.73 million. Similarly, when the 1998 data is examined, the value of actual imports into the EU using ex-coldstore values comes to ZAR 111.97 million. When the import value reflected in the 1998 Eurostat data is converted into South Africa Rands it comes to ZAR110.3 8 million, which is again very close to the ex-coldstore values reflected in Globefish European Fish Price Reports. If the values differed significantly it would have suggested the accumulation of rent following import and before any further value-adding takes place.

The above analysis is limited in as much as it does not deal with the possibility that rent accrues at the value-added stage, after it has left the coldstore in Spain or elsewhere in the European Union. However, up to the point at which the headed and gutted hake leaves the coldstore, it would not seem that rent is accruing in Spain but rather in South Africa itself. The key policy issue then becomes who is benefiting mostly from the resource rent and whether this meets the policy objectives of the South African government.

3 Resource rent accrual

If having a quota is regarded as possessing an asset of considerable value, then rent is accumulating within the industry. Part of the rent is collected by the Government in the form of taxes, levies and other charges and part by importing states through the charging of import tariffs.

3.1 Government receipts

South Africa has more recently introduced catch levies for hake. The objective of the Government is to eventually cover the costs of management by increasing the levies over the next few years. The schedule of levies for hake are given in Table 3 (Chapter 2). An estimation of the revenue that should be collected in 2002 from the hake fisheries is presented in Table 35. The catch is estimated at 98% of the 2002 hake TAC, the percentage of the TAC that was caught in 1998. Applying the levies applicable for 2002 provides a total of ZAR 25.7 million.

As is the case with Namibia, corporate tax receipts are regarded as confidential and it was not possible to collect any data regarding them.

fishery	TAC2002	catch 200e	levy per ton2002	expected revenue ZAR millions
deesea trawl	138495	135725.1	165	22.395
inshore trawl	10156	9952.88	156	1.553
lonline	10840	10623.2	165	1.753
Total				25.700

Table 35: Estimation of possible revenue from catch levies for hake for 2002.

3.2 Resource rent and the lease price of quotas.

A rough estimate of resource rent not collected by Government through the use of catch levies and licences fees, can be made using the informal market prices for quota. The operating companies are willing to pay these prices per kilogram of quota, not out of magnanimity, but because they see an opportunity to at least make something approaching normal profits by utilising the quotas. In Table 36 these prices are used to calculate the rent associated with the catch for each year.

	ZAR/kg paid for quota	nominal catch[1]	estimated rent ZAR millions
1997	?	147569	?
1998	?	149116	?
1999	2.80	138736	388.46
2000	3.00	146020	438.06
2001	3.20	151264	484.04
2002	4.00[2]	152581	610.32

1. Fishing Industry Handbook 2001, for 1997-1999; estimate of 98% of TAC (based on % of TAC caught in 1998) for 2000-2001;2002 - 98% of total allocated quotas. Prices per kg provided by MCM.
2. Expected price.

Table 36: Price per kilogram paid for quota, the nominal catch and estimated rent if informal market prices are regarded as proxy for rent per kilogram.

These figures, however, do need to be treated with some caution for several reasons. The market for the hake quota is not an open market between equals, because of the overwhelmingly dominant position of Irvin & Johnson and Sea Harvest in the harvesting, processing and marketing of hake. Smaller quota holders are likely to be price takers in these circumstances. This would have the effect of suppressing prices. In addition, the existence of excess capacity[37] means that there is probably a tendency to consider only short term operating costs; this might create some upward pressure on prices.

Note that these figures do not take account of rent already being dissipated on overcapacity in the fleet and on excess processing capacity. They do not give an indication, therefore, of potential resource rent available from the hake fishery.

[37] Glazer and Butterworth estimated that there was significant overcapacity of between 28% and 52% in the deep-sea hake trawl fishery in 1999 (Glazer and Butterworth, undated). No other indications were provided of the extent of overcapacity.

If one considers that the government can only expect to collect some R17 million[38] in 2001 and 2002, these revenues would be only be about 3.5% and 2.7% of what, at a conservative estimate, might be available in resource rent.

3.3 Import tariffs and resource rent

Import tariffs are used within the European Union of to protect the domestic fishing industry and to obtain supplies of raw materials for EU fish processing plants. The effect, however, is also to collect up a proportion of resource rent. If one considers the import values for hake products from South Africa for 1997 and 1998, reflected in Table 37, and the rates of duty applying for those years, European Union governments collected ZAR41.6 million in 1997 and ZAR48.83 million in 1998 through the imposition of import duties on hake products. As import duties intervene in the market by reducing the revenue that could accrue to the foreign exporter, this amounts to collecting a proportion of resource rents.

	Value of imports in '000				
	3026966 (subject to 15% import duty all 3 years)	3037811(subject to 8.9% duty in 1997; 7.6% in 1998; 6.3% in1999)	3042055 (subject to 8.9% duty in 1997 and 7.6% in 1998; 6.3% in1999)	Import duties '000	Import duties ZAR millions
1997	31485	18951	17701	7984.778	41.60
1998	31168	17800	24287	7873.812	48.83
1999	47319	21070	25732	10046.376	65.50

Table 37; Import duties collected by EU government from importation of hake catch. (Tariff rates from TARIC, EU Taxation and Customs Union Duty Rates; values of imports from Eurostat database COMEXT; /ZAR exchange rates from SA Reserve Bank: 1997: 1 =R5.2095; 1998: 1 =R6.201; 1999: 1 = R6.52)

3.4 Note on import tariffs and the longline fishery

While the EU's import tariffs for frozen hake product from South Africa have been reduced, the import tariff for fresh/chilled hake remains at 15%. Referring back to section 1.1 above, although actual flows are not available, a useful hypothetical exercise might usefully illustrate the share of resource rent that might be accruing to the SA Government in the form of catch levies, and the EU states in the form of import tariffs.

We know from Eurostat data (Eurostat database COMEXT) that South Africa exported 14625 tonnes of fresh/chilled hake products to the EU in 1999. From the data given in Table 22 and Table 23, it would appear that the entire catch in 1997 and 1998 from the deep-water and inshore trawl fisheries is landed either as headed and gutted product or as fillets. As the longline fishery lends itself to supplying the fresh fish export market and as there is substantial trade in fresh product, the assumption can be made that the longline fishery is only supplying that market.

Suppose that 98% (9629 tonne) of the longline allocation in 2002 (9825 tonnes) is caught by the longline fishery and is sold as head-on gutted product on the EU market[39]. The

[38] Catch levy per tonne of ZAR115, and assuming that 98% of TAC is caught.

[39] Not all is sold in this form as we know that sufficient fresh Cape hake in the form of loins is sold on the EU market to warrant the price being quoted in European Fish Price Reports. (Globefish 2002).

landed mass for head-on gutted product would be 8754 tonnes[40]. At the average French supermarket price of ZAR85.16/kg (8.30) for Cape hake from South Africa for March 2002 (Globefish 2002), the gross value of the catch in headed and gutted form would be ZAR745.491 million (8754x1000x85.16).

To provide a basis for calculating the import tariff, let us suppose that the EU importers import the 8754 tonnes of fresh hake into the EU for 60% of this value, that is, for ZAR447.294 million[41]. Using a relatively low figure for the imported (cif) value probably understates the import tariff collected in the EU, which, on this basis, would be R67.09 million (R447.294 million x 15%). In other words, while the treasuries of EU states collect R67.09 million from this portion of the South African hake catch in the form of import tariffs, the South African Government, in contrast, would collect R1.59 million (9629 tonnes x R165) in catch levies.

While there are too many assumptions involved in the above discussion of fresh hake exports to rely on the figures, it does suggest that this part of the hake export industry warrants further detailed investigation.

4 Conclusion

Overall, the dearth of adequate economic data in particular, makes the examination of the resource rent particularly problematic. The exercise undertaken in the preceding pages offers a tentative glimpse of the extent of resource rent realisable and where it might be accruing. No evidence has been obtained that suggests that rent is accruing abroad from hake exports. This, however, does not preclude the possibility of this happening in the value-adding part of the industry in Europe, particularly with the rapidly rising prices that have been experienced in recent years.

[40] Catch of 9629 divided by the conversion factor 1.1.

[41] This is something of a guess (though probably conservative), as we cannot assume that, because substantial rent appears to be collected in the trawl fisheries on the South African end, that it necessarily happens in this way in the longline fishery.

Chapter 5
Conclusions and recommendations

This report demonstrates that there is substantial rent associated with the hake resources of South Africa and Namibia. This is not unexpected and is consistent with the public perception in both countries that acquiring a hake quota has associated with it the acquisition of a right of considerable value. It is difficult, however, to assess the actual rent that accrues in these fisheries, to quantify where it accrues, and to arrive at an estimation of potential rent that is not yet being realised.

Such calculations are difficult under the best of circumstances, because of the large number of factors that have a bearing on the level of rent associated with the particular species at a particular time. The most important of these factors, which include prevailing market conditions and the impact of environmental variations, were discussed briefly in Chapter 1. While some useful data was acquired from various sources for this study, the dearth of adequate data made the exercise particularly problematic. The fact that it was essentially a desk study limited the capacity to collect data that might be available, but difficult to acquire at a distance.

1 Actual resource rent

1.1 Covering the costs: collecting part of the rent

In both Namibia and South Africa, some of the rent is being collected by the Governments in the form of various charges. The cost of managing the fisheries generally is not allocated to each fishery separately, but is given for the fisheries sector as a whole. Thus it is not possible to assess the extent to which the cost of managing the hake fisheries, in particular, is being covered by revenue collected in relation to the hake fisheries. However, in both instances, the receipts from the hake fisheries make a substantial contribution to the revenues collected for covering overall costs of management.

It appears that Namibia has more than covered the costs of management for most of the past decade. However, the combination of rising prices and a depreciation of the Namibia dollar against the currencies of its principal markets, means that there has been a particularly steep rise in the Namibia dollar value of the country's hake production. The revenue collected by the Government has remained relatively static for most of the last decade and has not risen nearly as steeply as the estimated value of production in Namibian dollar terms. With the substantial increases in levies imposed in 2001, it is expected, on the basis of TAC's that have been set in recent years, that the Government should now be collecting about N$ 90 million from the hake fisheries through various levies and fees. Rent collected by the Government between 1994 and 1999 from the hake fishery varied between N$ 55 million and N$ 72 million per annum (leaving aside the anomalous year, 1996).

The adoption of the "user pays principle" in South Africa is more recent. The catch levy receipts for the whole of the fisheries sector in 2001 were approximately ZAR40 million but with the gradual increase in catch levies it is expected that this sum should reach ZAR 90 million per annum by 2005 (DEAT 2001). It was estimated in Chapter 4, the section 3.1 that the revenue collected by the South African Government from catch levies for 2002 would be about ZAR25.7 million.

1.2 Rent accruing to the industry

It was evident from Chapters 3 and 4 that substantial rent is accruing in the hake fisheries in both Namibia and South Africa.

An indication of the rent associated with the hake quota, although not perfect, is the price per tonne that operating companies within the hake industry are willing to pay other quota holders for the use of their quota each year.

Estimates of the resource rent (and expected rent) based on these prices and accruing to the industry in Namibia were given in Chapter 3, section 2.1.1. Resource rent accruing to the industry for 2000 and 2001 are estimated to be N$252 million and N$296 million respectively. An estimation of expected rent for 2002 is N$374 million.

Similar estimates of the rent actually accruing to the industry in the South African hake fisheries were the ZAR388 million (1999), ZAR438 million (2000), ZAR484 million (2001) and ZAR610 million (2002). The rent accruing to the industry in South Africa is greater than appears to be the case in Namibia, despite the fact that the TAC's for hake in South Africa are a little lower than in Namibia. This is partly explained by the fact that the South African industry pays lower catch levies than the Namibian industry has paid in quota levies. The lower rent accruing in Namibia may also in part be explained by the policy of insisting that a high percentage (now about 60 percent) of the hake quota be landed wet for onshore processing. This results in a range of products which have lower export prices that the equivalent product frozen at sea. Lower rents in Namibia may also be explained by some possible transfer pricing of profit from Namibia.

On the other hand, import tariffs are paid on hake products from South Africa sold into the European market which would have the effect of lowering revenue for the South African exporters.

1.3 Rent accruing to European governments

Namibian hake exports enter the EU free of import duties in terms of the provisions of the Cotonou Agreement.

Imports of hake products originating from South Africa attract EU import tariffs. An effect of import tariffs is to reduce the profit that might otherwise have been earned by the exporter selling the product in that market. Thus the European Union governments claim part of the rent generated in the South African hake fishery. For the years for which data was available from Eurostat, that is 1997,1998 and 1999, the amounts collected in EU import tariffs on the South African hake are estimated to be ZAR41.6

million, ZAR48.8 million and ZAR65.5 million respectively (see Table 37). European Union governments were collecting more in import tariffs from hake than the South African Government was collecting in levies and other charges from the fisheries as a whole.

1.4 Resource rent – the possibility of transfer pricing

In section 2.2 of Chapter 3, the values extracted from Eurostat for the imports of Namibian hake in 1997, 1998 and 1999 were worked backwards so that they could be compared to the export values given for Namibian hake. The import values extracted from the Eurostat data, less transport and related costs, were N$54.862 million higher than the export value from Namibia in 1998, and N$363.567million higher in 1999. The significant difference, particularly in 1999 between the value of exports declared in Namibia and value of those same exports on arrival at European ports (less the cost of transportation) suggests that there is transfer pricing involving significant values taking place. This would mean that part of the resource rent is being exported.

This issue would benefit from more detailed investigation. The annual survey of the industry undertaken by the MFMR requires companies to give details of the products that they produce. This information could be used in conjunction with price data from GlobeFish European Fish Price Reports to investigate this issue more thoroughly.

Evidence of transfer pricing in relation to the South African hake production was not found.

1.5 Rent spent on the social development projects

A small proportion of the rent accumulating in Namibia (equivalent to about N$ 00.01 per kg) has been allocated by the hake fishing companies to various social development projects. During the eleven-year period between 1990 and 2001, companies in the hake fishery were reported to have made contributions of N$16.472 million to such projects.

No evidence was collected of any similar social development expenditure relating to the South African hake fisheries.

2 Dissipation of resource rent

Resource rent may be dissipated in various ways. One of the main areas of rent dissipation in most fisheries is the development of overcapacity.

2.1 Financing overcapacity - dissipating resource rent

A feature of open access fisheries is that eventually the resource rent is dissipated on excess capacity. However, the South African and Namibian fisheries authorities have in place fisheries management measures which, to a large extent, offer an incentive to fishing companies to harvest the quota assigned to them in most efficient manner possible. The TAC and quota system largely eliminates the compulsion, found in open

access fisheries, to catch fish before others harvest them, and to build as much capacity to achieve that end as can be afforded.

A difficulty arises when other incentives are created to build capacity. Motivated by the desire to encourage active participation in the fishing industry by sectors of the population discriminated against during the apartheid period, both governments have linked receiving rights, and then retaining them, to acquiring capacity in both vessels and processing facilities.

While there exists some evidence of overcapacity, there was insufficient data available to quantify the extent of overcapacity, to calculate the capital cost of that overcapacity and thus to arrive at an estimate of the cost of capital, which involves the absorption of resource rent.

An estimate that there was significant overcapacity of between 28% and 52% in the deep sea hake trawl fishery in 1999 (footnote 37) suggests that there is considerable dissipation of rent in the South African deepsea trawl fleet. The absence of further information regarding the age, type and technical capacity of vessels, or estimates of the value of the fleet, meant that it was not possible within the limitations of this research exercise to evaluate the overcapacity. No estimates of overcapacity in the inshore and longline fisheries or of the extent of any overcapacity in processing was provided for South Africa.

Equally in the case of Namibia insufficient data was available to evaluate the loss of rent as a result of overcapacity. As part of its drive to create more jobs in the fishing industry, in the early 1990s the Ministry of Fisheries and Marine Resources made it clear that companies that invested in onshore processing capacity would be favoured in the allocation of quotas. In 1998 it was widely known that hake processing facilities had a capacity to process about 160,000 tonnes of hake per annum, while only 85,000 tonnes of hake was allocated for onshore processing in that year (Blatt, 1998). However, TAC's have risen, and the percentage now being allocated for onshore processing has risen, which increases the use of the processing capacity.

The extent of overcapacity in fleet and processing facilities needs further thorough investigation. There is also an urgent need to ensure that incentives do not exist that encourage the development of overcapacity.

2.2 Rent and job creation

It appears that Namibia's policy of insisting that 60 percent of the hake TAC be allocated for onshore processing is very costly in terms of the loss of rent. Although not quantified, there is probably also a loss involved due to higher costs of processing onshore. In addition, an estimate was made in Chapter 3, section 2.5, of the loss of revenue as a result of the policy. This, when related to the number of extra jobs created in the hake fishery, makes the policy appear very costly in terms of the loss of resource rent (Chapter 3, section 2.6.2). It was estimated and that the loss of revenue in 1999 was N$128.70 million, or N$51 214 per extra jobs created. The loss of revenue for the

following year, 2000, was estimated at N$225.13 7 million, or N$89 589 per additional job.

It would seem advisable to re-examine this policy. The difficulty now exists in that there has already been very considerable investment in the wet fish fleet and in onshore processing capacity and a re-assessment of the policy would obviously need to take this into account.

3 A concluding remark

An attempt to draw these estimations of rent and potential rent together in a table (Table 38)illustrates the point that the data is too sparse to draw any definite and reliable conclusions.

	Namibia						South Africa					
	97	98	99	00	01	02	97	98	99	00	01	02
Government revenue	57.0	55.0	70.7									25.7
Rent accruing to industry			200	252	296	374?		388	438	484	610	
Import tariffs on hake exports							41.6	48.8	65.5			
Rent accruing abroad -Transfer pricing		54.9	363.6									
Social development expenditure by companies	N$ 16.472 between 1990 -2001											
Loss of revenue (landing wet policy)			128.7	225.13								

Table 38: Summary of the estimates of rent and potential rent.

However, there is sufficient evidence to justify further exploration of this topic and for greater focus on gathering the data necessary for more thorough and reliable analysis.

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Appendix A
Namibianisation and consolidation of companies in the hake fishery[42].

It was noted in section 2.1.2 of Chapter 3 that there has been considerable consolidation in recent years of the industry around a handful of large companies and their absorption of many of the "newcomer" companies in one way or the other. Closer examination of this process offers an insight into the nature of developments within the industry. The analysis below is drawn from earlier work (Manning 2001). The list companies that have rights of exploitation, plus a number of others which own licensed fishing vessels but are not rights holders, formed the starting point of this investigation. Two pieces of information were obtained from the Register of Companies, held by the Ministry of Trade and Industry (MTI Register). The names of the directors of the companies and the address, in each case, where the company's register of members43 is held were extracted from the Register of Companies.

The identification of a company as a shareholder necessitated fresh scrutiny of the Register of Companies and the follow-up process of tracing that company's register of members. This was repeated as far as possible until the beneficial shareholders were identified. In some cases the shareholders were identified as nominee shareholders and the true identity of the beneficial shareholders could not be established. In others, a shareholder was a foreign registered company for whom it was not usually possible, within the financial and time limitations of that project, to establish the identity of the beneficial shareholders.

The following were the main groups of companies in the Namibian hake fisheries.

1 NovaNam - Pescanova

NovaNam was registered as a Namibian company in 1995. It has its head-office in Cape Town. Previously, Pescanova Fishing Industries of Namibia was a wholly owned subsidiary of Pescanova SA, the Spanish multinational fishing company. There was no apparent pressure on Pescanova SA to "Namibianise" the company. It enjoyed the largest quota in the hake fishery, one that was two and a half times the size of the next largest quota in the hake fishery (FIH 1996, p77). However, by "Namibianising" its interest through the establishment of NovaNam, it immediately saved itself N$200 per tonne of hake on the basis that its quota was being caught by vessels that are 51% or more Namibian owned. On the annual quota of 25 837 tonnes of hake at the time (between 1994-1996), this meant an immediate saving of N$5.167 million in quota levy payments (see Table 1, Chapter 2, section3.1) at the expense of Government revenue. The definitions of vessels have now changed and so have the quota levies payable; NovaNam now probably saves N$900 per tonne of hake quota as a result of the change, depending on whether they now meet the crewing requirements for "Namibian vessels".

Namibianising the company was achieved through a judicious mix of ordinary and preference shares. Pescanova SA has 49% of the shares and 2% are in the name of the NovaNam Staff Trust, both lots being ordinary shares. The remaining 49% are held by NIB Nominees, with the

[42] The content of this appendix is largely drawn from Manning 2001. It is essentially a snap shot of the ownership and control of fishing companies in the hake fishery in late 1999/early 2000.

[43] The term 'register of members' is used in the Companies Act 61, 1973 (South Africa 1973), the applicable statute in Namibian law. The terms 'transfer register' and 'share register' are also used in the industry to describe the same register which contains the official record of shareholdings and the history, for at least 15 years, of transfers of shares.

beneficiaries being "Namibian institutions and individuals". These shares are preference shares for with voting rights the same as those of ordinary shares44 but with dividends being calculated differently. Neither the identity of the institutions nor of the individuals has been made known.

Pescanova SA have achieved the change to the structure of their shareholding in such a way that they and the Namibian Government can say that NovaNam is 51% Namibian owned, without it being publicly known who the new beneficial shareholders are, whether there were any management agreements involved in the sale of shares to the "Namibian institutions and individuals", or whether the control by Pescanova is maintained through the shares held in the name of the NovaNam Staff Trust. Whatever the mechanism is that Pescanova SA used, the same management team now run NovaNam as ran Pescanova's interests in Namibia before the change in shareholding was arranged. It appears that Pescanova SA remains firmly in control of the Namibianised company.

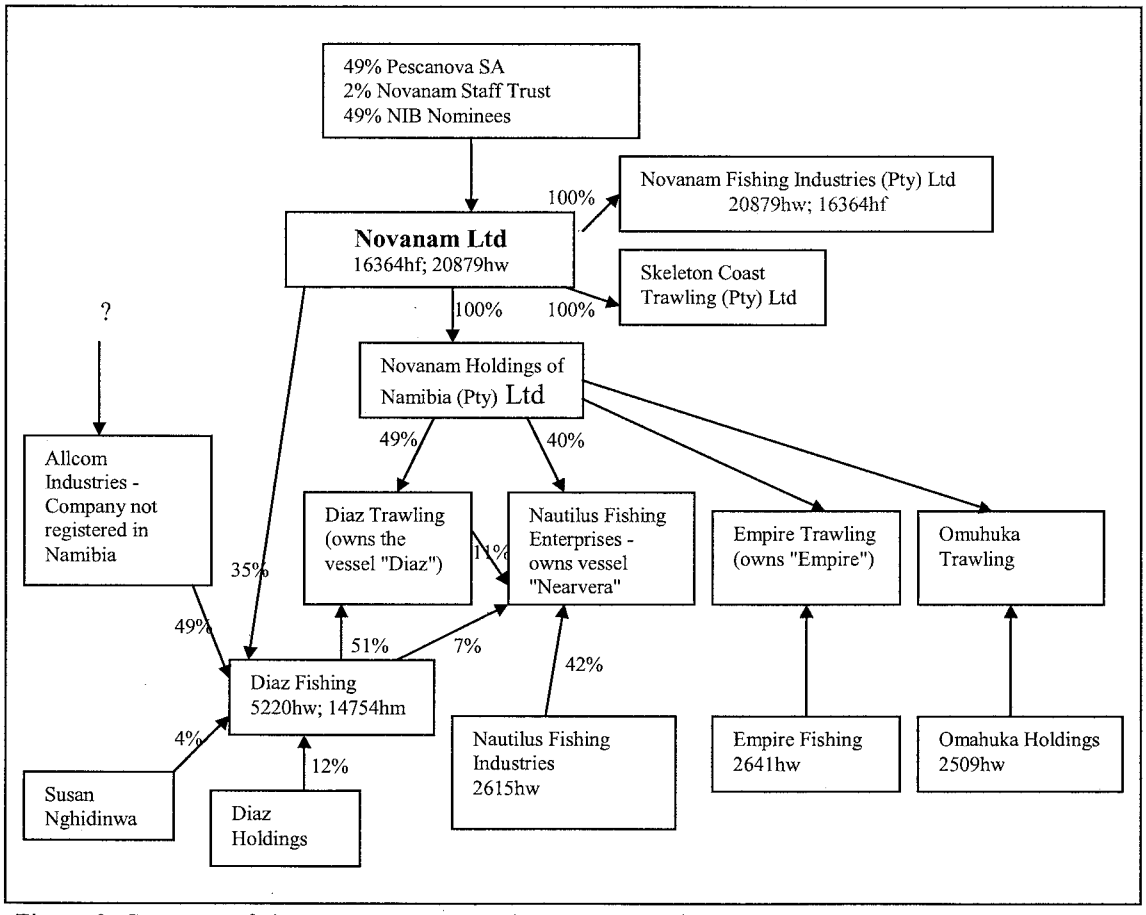

Figure 9: Structure of the NovaNam group of companies and relationships with newcomer companies. (hw= hake wet quota; hf = hake freezer quota; hm = horse mackerel quota. % indicates share ownership.)

NovaNam has set up a series of joint venture arrangements involving newcomer companies. Typically these are not arrangements between equals. The established operational company comes into such relationships from a position of considerable strength, exercising power within the relationship arising from their financial capacity, marketing access and know-how, and harvesting and processing capacity. The newcomer company, without access to finance and

[44] Voting rights for the holders of preference shares is normally restricted.

needing to have the catch harvested and sold, have been forced in one way or the other into joint venture relationships that would not have been in their best interests had an adequate support structure existed. Holding a majority of the shares is of little consequence if the majority shareholders, through force of circumstance, have no real options available to them. Relying on shares in the joint venture to determine where rent accrues is not realistic and generally does not reflect the reality of the power relationships.

NovaNam developed joint venture companies with some of the newcomer companies in the industry as illustrated in Figure 1. If one considers the example of Diaz Fishing (Pty) Ltd, a newcomer company, granted a quota under the affirmative action provisions of the fisheries policy. The interests of the two remaining original shareholders are now held by Diaz Holdings (Pty) Ltd, which has a 12% share in Diaz Fishing. The remaining part of the 51% Namibian share of Diaz Fishing is maintained through the 4% share of an individual, a 35% share held by NovaNam itself, which is Namibian by virtue of the 51% of the shares formally held by the unnamed "Namibian institutions and individuals" and the 2% in the name of the NovaNam Staff Trust. The remaining 49% of the shares are held by Allcom Industries, which appears to be a Cuban owned company not registered in Namibia. All told, it seems that two thirds of the ultimate shareholders of Diaz Fishing are not Namibian[45]. Similarly 57.7% of the ultimate shareholding of Diaz Trawling, which owns the vessel "Diaz", are not Namibian, despite the fact that the vessel is registered as being Namibian owned.

In the case of Nautilus Fishing Industries, the newcomer company contributing a quota to the joint venture, has a 42% interest in Nautilus Fishing Enterprises which owns the vessel "Nearvera". Judging from the directorships of the Empire Trawling and Omuhuka Trawling, these two companies have a similar relationship to NovaNam. Whatever the case, NovaNam management run the four joint venture operations. They apply, for example, for the licenses for the four vessels owned by the joint venture companies in the names of the newcomer companies (Register of Fishing Vessels). NovaNam management may argue that they are merely helping out the newcomers but the reality is that the newcomer companies have very little or no operational involvement in running these vessels or in other operational aspects of the harvesting, processing or marketing of the catch. It is hard to accept that these companies are genuinely developing in the fishing industry. It appears that their most active involvement in the industry is the collection of a proportion of the rent in exchange for passing on the quota to NovaNam to fish, process and market.

This is not meant as an accusation against the major companies involved in the industry. They were not set up for the purpose of philanthropy but in order to make a profit and they are simply responding to the set of rules established to govern the functioning of the industry in the way that is most advantageous to them. Incentives were created to encourage investment in the industry and to expect reward in the form of increased quotas for doing so. It is not surprising that companies then created processing facilitates capable of a throughput considerably greater than the quotas they then had. Ways had to be devised by the major companies to use the capacity so established. It is also not meant as a criticism of the small newcomer companies. They have had little or no option, in the

[45] 49% held by Allcom Industries, and 49% of the 35% held by NovaNam.

absence of access to adequate finance and technical advice, other than to become involved with the major companies in the way that they have done.

The example, however, does illustrate how poorly the equity element of Government policy is being met in practice.

NovaNam have control over some 23% of the total hake quota, and also enjoy the benefit of rights in the horse mackerel fishery.

2 The group of companies associated with Namibia Fishing Industries (Namfish) and the merging with Sea Harvest (Namibia)

Namfish was established in 1947 as the South West Africa Fishing Industries Ltd and is dual listed on the Namibian and Johannesburg stock exchanges. When applications for rights of exploitation were submitted in 1993 to the MFMR, the Ministry required from applicants details regarding the beneficial share ownership of the companies in order to determine the extent to which they were Namibian owned. Namfish, together with its sister company, Namibia Sea Products (Namsea), made the case to the MFMR that it was not possible for them to determine the nationality of their shareholders because, as listed companies, they have over 2000 shareholders each. They argued that the residency of the shareholders, rather than their nationality, should be taken into consideration in their case. The Ministry decided to accept this proposal (Clark 1994).

The company's principal shareholders made extensive use of nominees shareholders[46]. Whatever the reason for which this might be done, it has the effect of hiding the true identity of the beneficial shareholders and, in so doing, of nullifying the efficacy of the provision of the Companies Act which makes it an offence for a company to withhold information about its shareholdings (South Africa 1973, s113(1)).

Namsea, with more than three quarters of its shares held by nominees in the mid-1990s, in turn held 36.6% of the shares in Namfish, either directly or though its wholly owned subsidiary, Sarusas Development Corporation. A further 40% of Namfish's shares were held by nominee shareholders. In total some 76.6% of the shares were held by nominee shareholders or by Namsea, the vast majority of whose shares were in turn held by nominees.

It transpired that the identity of the principal shareholder, P.C. Kuttel, a Cape Town fisheries entrepreneur, was well known as he and his family were identified in a Johannesburg Stock Exchange handbook as being the principle shareholder in Namsea and Namfish (JSE, 1996). The use of nominees was clearly used in this instance to present a veneer of being Namibian and so claim the generous levy rebates

The activities of Namfish and Namsea have become less intertwined than they were in the mid-1990s as a result of a rationalisation of their respective activities. Namfish sold their interests in the pelagic sub-sector to Namsea so as to enable Namfish to focus

[46] A person, company or trust holding shares on behalf of the beneficial shareholders.

principally on the hake sub-sector. Figure 10 graphically presents the new structure of Namfish and Namsea as it was in early 2000.

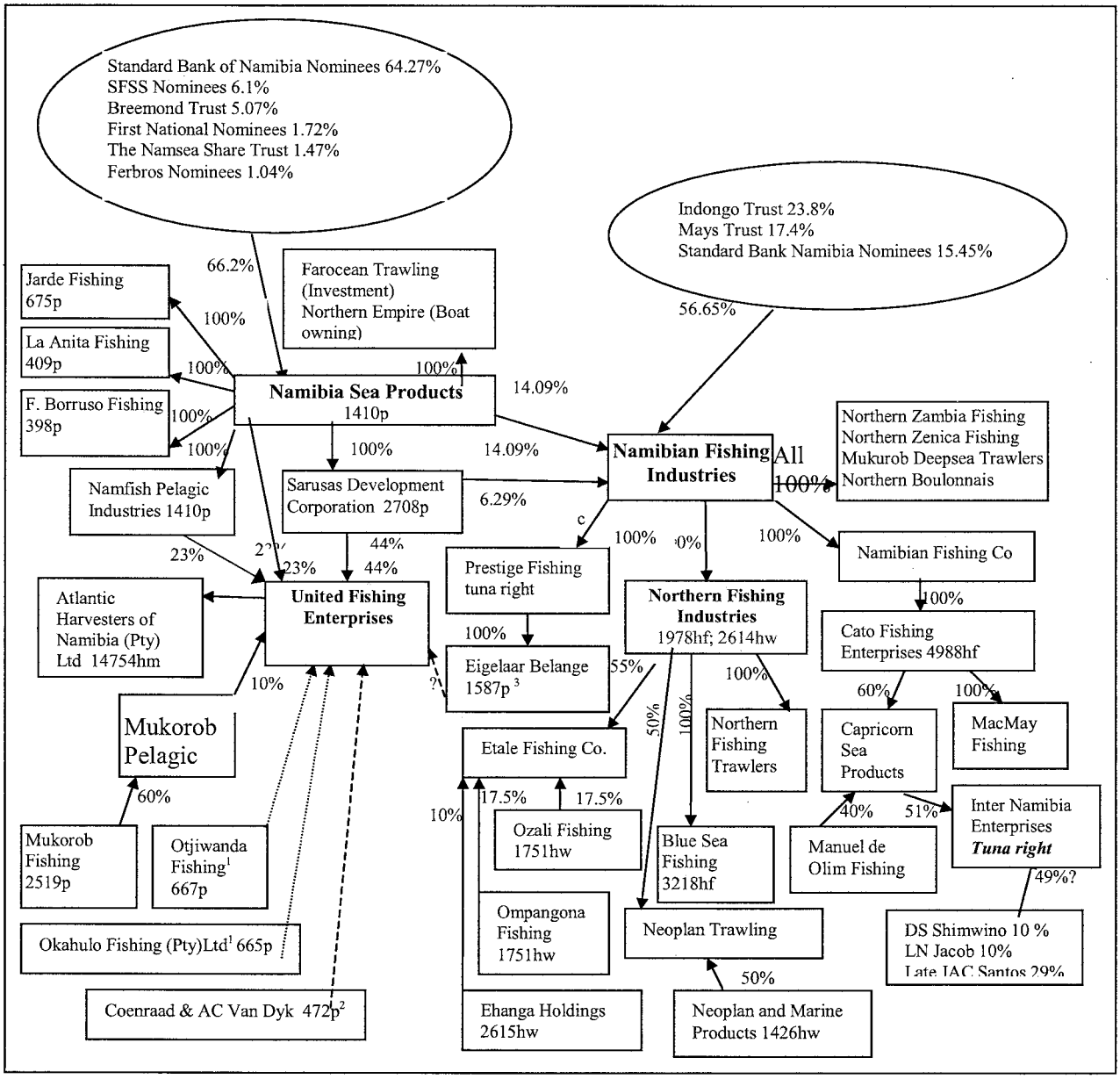

Figure 10: Cluster of companies associated with Namfish. (p=pilchard; hw=hake wet quota; hf = hake freezer quota; tuna right = has a right to fish for tuna; hm = horse mackerel. % indicates share ownership.) *[1]Both have a share in the vessel Reinoyfisk together with Namsea, Namfish, Mukorob Fishing Company and Sarusas Development Corporation. [2] Mortgage for vessel 'Alert III' from United Fishing Enterprises.*

In order to rationalise the use of resources, Namfish, through its wholly owned subsidiary Northern Fishing Industries, made two major strategic moves aimed at accumulating more quota to match their processing and fleet capacity. The first was the creation of a joint venture operation, Etale Fishing, with three newcomer companies. Northern Fishing

have a 55% share in the Etale Fishing, and the three newcomers between them have a 45% share. The operational side of the joint venture arrangement is in the hands of Northern Fishing and the involvement of the three newcomer companies is to deliver quota to the operation.

The second important strategic decision was the purchase of the Namibian Fishing Company (NamCo) group, the holding company of Cato Fishing. The Group own a freezer factory trawler, wetfish trawlers and line fish vessels but no shore-based processing facilities. Namfish had under-utilised shore processing capacity. By combining the two groups it was possible to considerably increase efficiency by matching the quotas available to the enlarged group with catching and processing capacity.

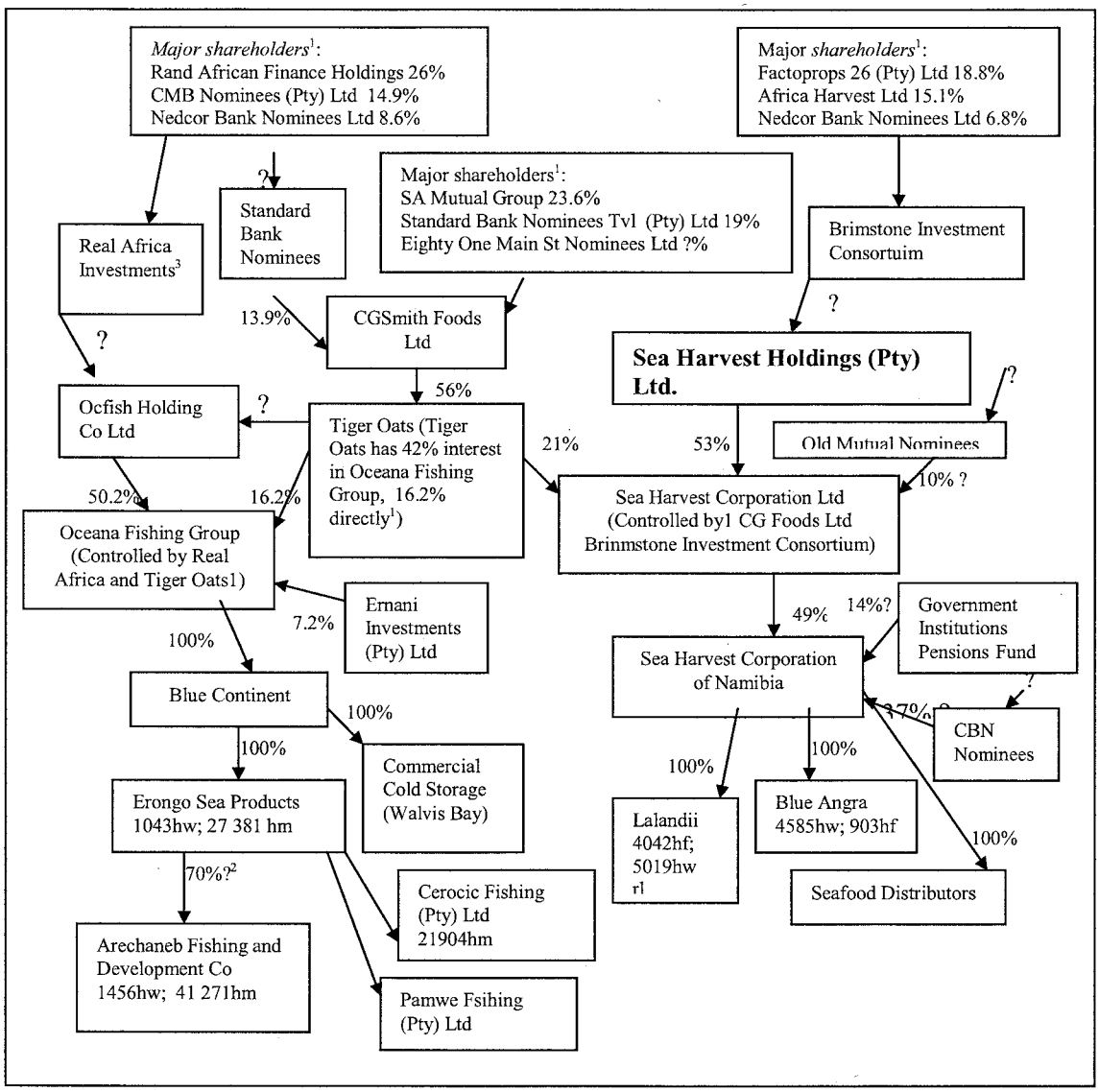

Figure 11: The Sea Harvest Corporation and its associated companies. (hw=hake wet quota; hf = hake freezer quota; hm = horse mackerel)

Two more recent developments have been the establishment of a joint venture operation with Neoplan Fishing and Marine Products, another newcomer company and the merging of Namfish and Sea Harvest (Namibia) coupled with the purchase by Sea Harvest South Africa of a 34.5% share in Namfish (Fishing News International, 2000, p26), forging even greater consolidation within the hake fishery. Namsea no longer has a share in Namfish (ibid.).

Namfish and Neoplan Fishing and Marine Products each a have a 50% interest in the joint venture operation, Neoplan Trawling. The agreement provides for Neoplan Fishing delivering the quota to the joint venture and Namfish providing the catching, processing and marketing (ibid.)

The merging with Sea Harvest (Namibia), which operates out of Lüderitz in the hake and rock lobster fisheries (ibid.), through the acquisition of an 34.5% interest in Namfish by Sea Harvest (South Africa) raises the question as to who is really in control of Namfish. Is it perhaps Sea Harvest (South Africa)?

Sea Harvest (South Africa), together with Irvin and Johnson, dominate the hake fishery in South Africa. The ownership structure of Sea Harvest (South Africa) presented in Figure 11 makes it clear that it is very difficult to be sure where the control of Sea Harvest lies. McGregor's Who owns Whom in South Africa 1999 (McGregor's 1999a), offers its "assessment of the identity of the ultimate controlling shareholder" as being "SA Mutual via Tiger Oats[47] and Real African Investments". SA Mutual is a large South African financial services company whose main business is pensions and life insurance. Sea Harvest Corporation delisted from the Johannesburg in December 2000 (JSE Handbook Jan-Jun 2002).

This cluster of companies around the merged Namfish/Sea Harvest enterprise have accumulated about 14.5% of the total hake quota, and also have interests in the monk and sole and the tuna fisheries.

3 Tunacor Group and Cadilu

Another concentration of hake quotas surrounds the array of enterprises established by, or with the involvement of, Messrs. Jose Luis Bastos, Manuel de Conceicao de Castro and Diamantino Fufino de Silva Correia which are depicted in Figure 12.

Cadilu was established by Messrs Bastos, de Castro and Correia, who between them held 51% of the shares in equal allotments, together with the large Spanish fishing company, Eduardo Vieira SA, which held the remaining 49%. The three subsequently sold their shares to Eduardo Vieira SA, which lays claim to being the world's biggest hake quota holder (Fishing News International 2000b), and to The Commonwealth Development Corporation so that the former holds 83.3% of the shares and the latter 16.7%. Cadilu is thus 100% foreign owned.

[47] Note that Tiger Oats also has an interest in Erongo Sea Products and associated companies, through the Oceana Fishing Group, a South African company.

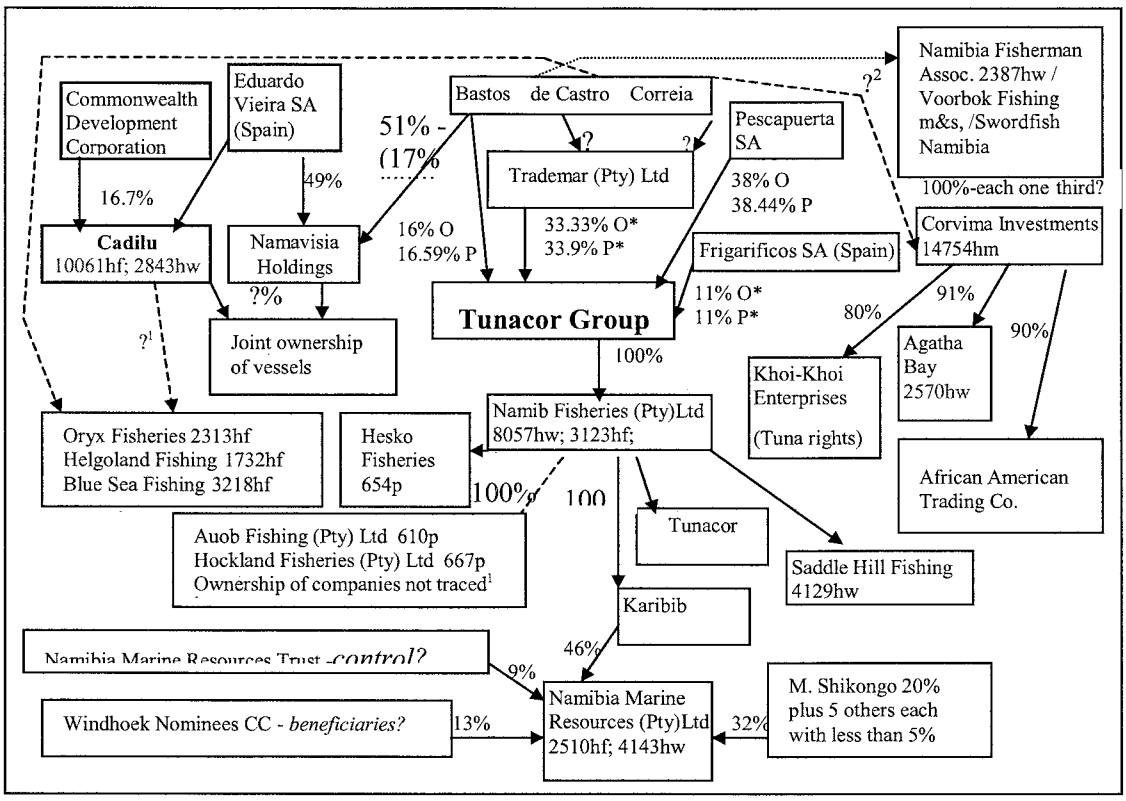

Figure 12: Enterprises associated with M Messrs Bastos, de Castro and Correia (* O = ordinary shares; P = preference shares). (p=pilchard; hw=hake wet quota; hf = hake freezer quota; tuna right = has a right to fish for tuna; hm = horse mackerel) *([1]vessels ' Nossob' and 'Kunene' used by these companies respectively are 50% owned by the company and 50% by Namib Fisheries in each case. Namib Fisheries probably have substantial interest or control)*

Cadilu was established by Messrs Bastos, de Castro and Correia, who between them held 51% of the shares in equal allotments, together with the large Spanish fishing company, Eduardo Vieira SA, which held the remaining 49%. The three subsequently sold their shares to Eduardo Vieira SA, which lays claim to being the world's biggest hake quota holder (Fishing News International 2000b), and to The Commonwealth Development Corporation so that the former holds 83.3% of the shares and the latter 16.7%. Cadilu is thus 100% foreign owned.

The three fisheries entrepreneurs have continued their co-operation with Cadilu through the establishment of Namivisa Holdings, in which Cadilu holds 49% of the shares and the three hold 17% each, that is the remaining 51% between them. Cadilu and Namivisa Holdings jointly own the hake freezer trawlers, Rosendo da Vila and the Vieirasa Tres (MWTC, Register). As Namivisa Holdings is 51% Namibian owned, it is a majority owned Namibian company. It was not possible to establish the percentage ownership of these vessels, but if Namavisia Holdings then owns 51% of the shares of the vessels it could be argued that the vessels are majority Namibian owned, in as much as a Namibian company would own 51% of the shares. However, the beneficial shareholding in such an instance would be 74% foreign (49% + (.49x51%)) and 25% Namibian owned, due to

the share that Cadilu has in Namivisa Holdings. The MFMR seems to regard these vessels as Namibian for the purposes of levy rebates.

The hake freezer quotas of Oryx Fisheries, Helgoland Fishing and Blue Sea Fishing appear to be linked to Cadilu, although the shareholdings of these companies could not be traced. They are described as associated companies (Stuttaford 1998) and two of the three directors of Oryx and Helgoland are Messrs. DRDS Correia and J. Lloves Vieira in each case (ibid.).

The Tunacor Group are another main group of companies involving the three fisheries entrepreneurs. Namib Fisheries, a wholly owned subsidiary of the Tunacor Group, has substantial quotas in the hake freezer and wet fish fisheries and has a pilchard right. They have also gained control of several newcomer companies whose hake and pilchard quotas they harvest and process.

Two Spanish companies, Pescapuerta SA and Frigarificos SA hold 38% and 11% of the ordinary and preference shares respectively, i.e. 49% of the ordinary shares and of the preference shares between them. Most of the remainder of the Tunacor shares are held by the Messrs Bastos, de Castro and Correia either directly or through Trademar (Pty) Ltd; 1.7% of the shares are held by another of the directors.

A third cluster of companies which the three business partners have created surrounds Corvima Investments (Figure 12) [48]. In this instance they have gained hake and tuna rights through taking control of three of the smaller rights-holding companies.

They also have interests in Voorbok Fishing, which has a monk and sole right, and in Swordfish Namibia, which was at the time engaged in experimental fishing for swordfish in the Namibian EEZ.

If the quotas and rights are considered together, then this cluster of companies have control over about 28% of the hake quota, and interests in the pilchard, horse mackerel and tuna fisheries.

4 Consortium, Kuiseb and Irvin and Johnson

Further consolidation in the hake fishery has taken place with the formation of Hangana Seafoods. This is a joint venture between Consortium Fisheries Ltd, a Fishing company ultimately owned by the wealthy List family, and Kuiseb Fish Products, a company controlled by Irvin and Johnson Ltd, the large, established South African fishing company which, together with Sea Harvest, dominate the South African hake fishery. At the time of Namibia's independence, Kuiseb Fish Products was a wholly owned subsidiary of Irvin and Johnson (I&J). I&J is controlled by the South. African Hersov family (see Profile's 2000) mainly through Anglovaal Industries Ltd. These relationships are depicted in Figure 13 below.

[48] In 1996 the three partners each held one of the three shares that had been issued. It was not possible to check on the current shareholding as the register of member had apparently been temporarily mislaid.

Anglovaal, I&J's parent company, provided finance to enable a newly registered Namibian company, Naras Investments, to purchase 51% of the shares of Kuiseb Fish Products in the early 1990s. Naras Investments' shares in Kuiseb were made up of 49% ordinary shares and a further 2% of non-voting preference shares. Apart from Naras Investments not having a majority of voting shares, I&J retained control of Kuiseb through the existence of a management agreement through which I&J retain management control of the company and through a marketing agreement which, at the time, obliged Kuiseb to sell all their production through I&J (Manning1998). In this way I&J could guarantee favourable consideration of its application for a renewal of its right of exploitation when the existing concessions terminated at the end of 1993, having "Namibianised" through a partnership arrangement with a company whose shareholders were people "who have been socially, economically or educationally disadvantaged" by the system of apartheid (Namibia 1993a, regulation 2(a)). Any dividend costs involved in accommodating the 51% share ownership by Naras Investments could be provided for through charges for management and marketing services and through prices set by I&J for the products sold to it by Kuiseb Fish Products.

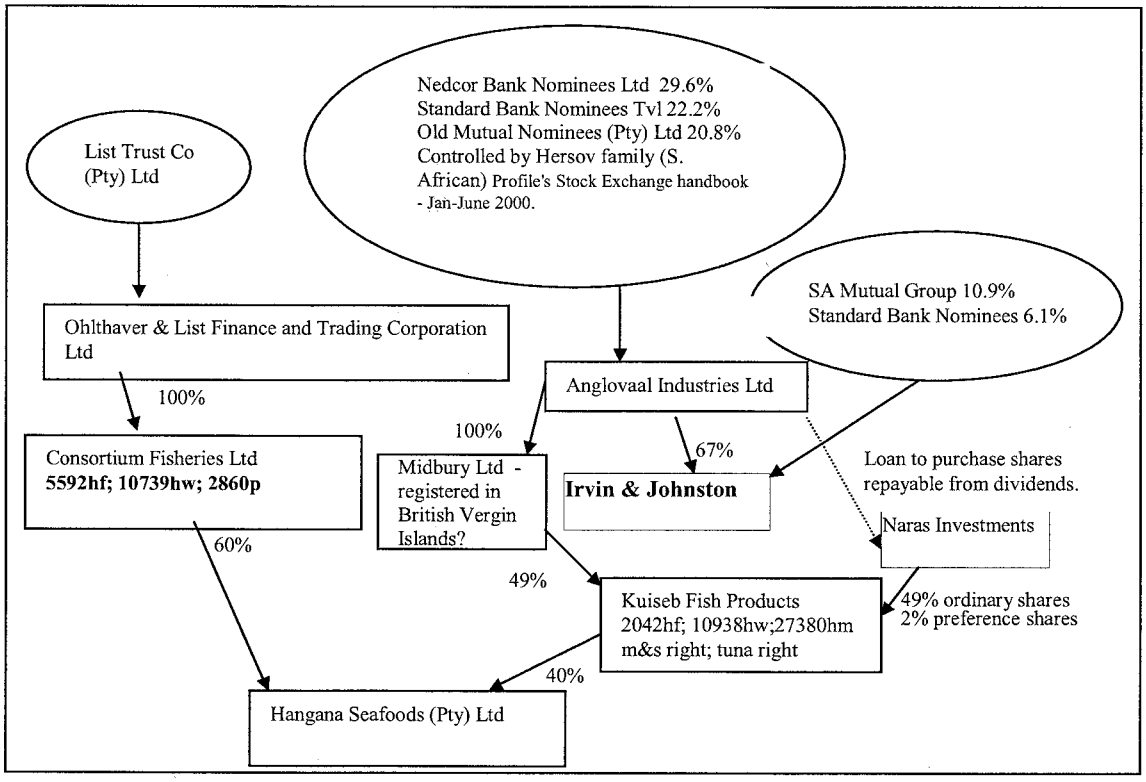

Figure 13: The Consortium / Irvin and Johnston joint venture. (p=pilchard; m&s = monk and sole right; hw=hake wet quota; hf = hake freezer quota; hm = horse mackerel)

Historically Consortium marketed product through I&J, so it is not surprising that a merger would take place between these companies (Moorsom 1984). Hangana Seafoods has its own sales department, but also sells product through Irvin and Johnson under the I&J brand-name.

The possibility of Naras Investments exercising any control over the operational side of the industry seems very remote.

Vertical integration makes it possible for companies to shift the costs and revenues within the group to their advantage. Where the power exists to determine where the costs and revenues are reflected, percentage ownership of a quota holding company becomes less significant. It should not be relied upon, therefore, in determining the distribution of benefit from the resource. There is no real price competition for fish in Namibia when it is landed in the port. No auctions exist and, for the most part, the prices are determined internally within the vertically integrated company structure. It is often stated that the biggest profits are made in the processing/marketing of fish. Another way of putting this is that the major companies, who control these aspects of delivering fish products to the market, choose to have any rents accumulate on that end of the process where they would more completely accumulate to rents for themselves. This is rational corporate behaviour for companies that are engaged in a sector that allow this to happen.

The joint venture, Hangana Seafoods, enjoys the benefit of 13.5% of the hake quota, 9.1% of the horse mackerel quota, and significant interests in the pilchard and monk and sole fisheries.

5 Gendor

The Gendor group of companies (Figure 14) no longer enjoys rights in the hake fishery, but it is worth noting the conditions that brought this about. The company was established in 1994, initially to undertake exploratory fishing for orange roughy and other deep-water resources. Gendor Holdings was established in 1998 and the new entity took over the shares of the Gendor Fishing (Pty) Ltd and Deep Ocean Resources Ltd.

Through a series of mergers and acquisitions it acquired quotas in the hake freezer and wet fish sub-sectors and was granted rights in the orange roughy/alfonsino fishery. Gendev of Namibia, a major shareholder in Gendor, have rights in the horse mackerel and pilchard fisheries.

In 1999, Gendor acquired, through a merger, two companies, Eros Fishing and Mangetti Fishing, that held 10 year rights in the hake fishery (due to expire at the end of 2003), with quotas in for both freezer and wet fish vessels. These two companies had been involved in a joint venture operation involving their parent company, Zebra Holdings[49] and Oya Namibia, wholly owned by Barconoya SA, a Spanish fishing company. Zebra, through its two subsidiaries, and Oya Namibia each held a 50% share in Coastal Marine which owned two wet fish vessels and a white fish processing plant (Gendor 1999). The freezer trawler, Conbaroya IV, used for fishing the quotas of Eros Fishing and Mangetti Fishing, was sold by Oya Namibia to Gendor through a share issue of 29 000 000 shares of 100 cents per share (ibid).

[49] The beneficial shareholders were said to be SWAPO although the shares were actually held by businessmen with close links to SWAPO.

In addition, Gendor "acquired a monk concession and the vessel MFV Estra Cruz from Namcoast (Pty) Ltd with effect from December 1998 for N$9.1m." (Gendor 1998). The emphasis in Gendor's annual report was about acquiring a right which fitted well with Gendor's resource and asset base (ibid.). Judging from the age and size of the vessel, most of the N$9.1 million paid to Namcoast represented the sale of a right of exploitation.

The Estra Cruz (76.7 gross registered tonnes), built 1964, was promptly replaced by the Whitby, which had been extensively refitted and converted into a freezer trawler. It is a larger vessel of 193 GRT and probably represents a considerable increase in fishing effort associated with the right.

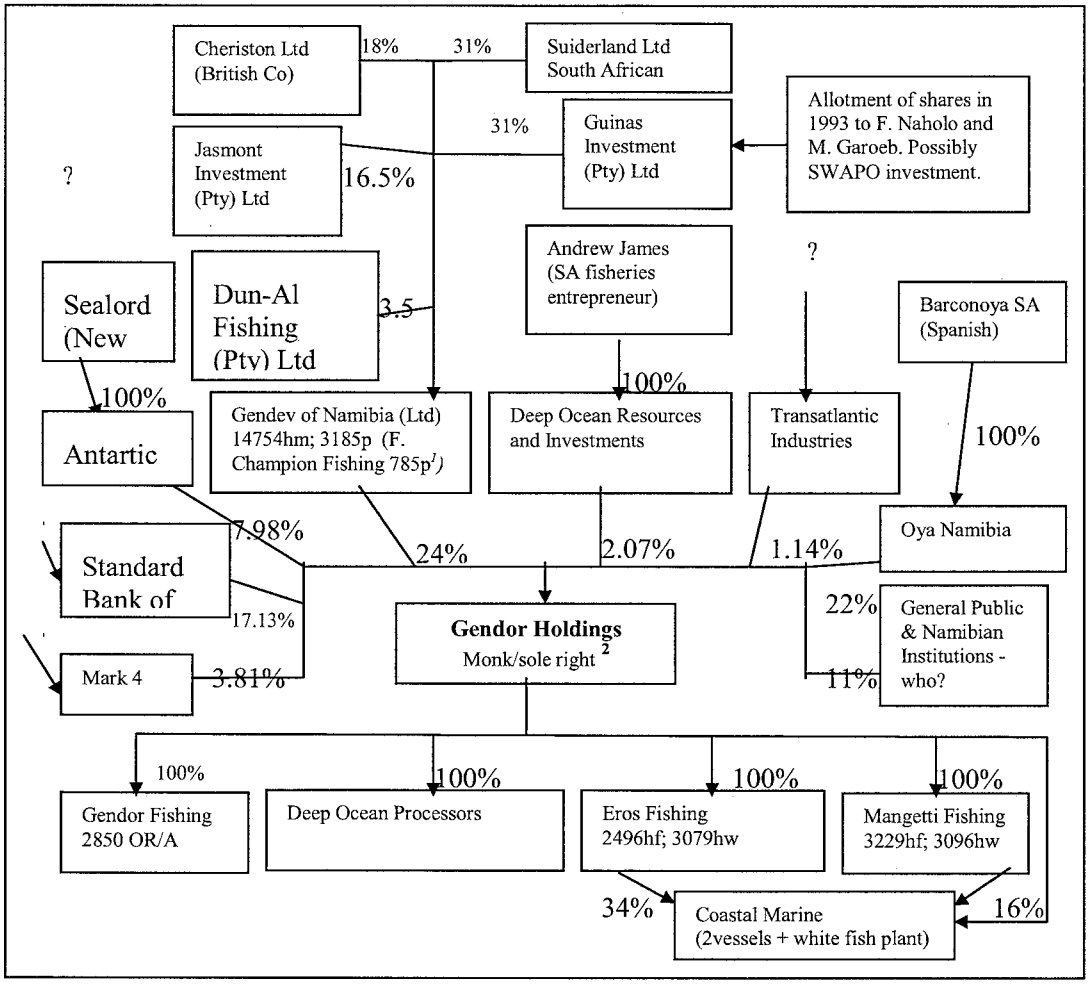

Figure 14: Gendor Holdings and associated companies. (p=pilchard; hw=hake wet quota; hf = hake freezer quota; OR/A = orange roughy/alfonsino; hm = horse mackerel) ([1]*ownership details not traced. Could be tied into Gendev as vessel 'Suiderkus' harvests both companies pilchard quota.* [2] *purchased from Namcoast December 1998*).

The Gendor cluster of companies enjoyed 5.5% of the hake quota, 50% of the orange roughy/alfonsino quota, 9.5% of the pilchard quota, 5% of the horse mackerel quota, and rights in the tuna and monk/sole fisheries.

However, the Ministry of Fisheries and Marine Resources informed Gendor in 2000 that, as it did not regard the company as fulfilling the criteria for the 10 year hake right granted to its newly acquired subsidiaries, Eros Fishing and Mangetti Fishing in 1993, the right was being reduced to 7 years and would thus be terminated at the end of 2000. The Ministry had indicated that preference would be given to larger fishing companies who entered into joint ventures with smaller Namibian fishing companies. In order to gain sufficient access to the hake resource, Gendor took over the Eros Fishing Company and Mangetti Fisheries, but acquired them instead of creating a joint venture. Thus, these two companies no longer contributed to Government's goal of Namibianising the fishing industry and the rights were terminated.

Appendix B

Product Form	Grading	Average price per kg in US$				
	gm/piece	1997	1998	1999	2000	2001
H&G – interleaved, FAS, ex coldstore Spain, from South Africa	<250	1.34	1.42	1.59	1.75	2.07
	250-350	1.44	1.53	1.72	1.83	2.15
	350-550	1.51	1.63	1.83	1.97	2.36
	550-680	1.62	1.77	2.03	2.23	2.65
	680-750	1.85	1.90	2.17	2.37	2.87
	750-950	2.01	2.05	2.30	2.51	3.03
	950-1300	2.25	2.32	2.66	2.84	3.39
H&G, IWP, landfrozen Spain fot - Namibia	100-200	1.24	1.30	1.33	1.32	1.60
	200-350	1.24	1.30	1.33	1.32	1.60
	350-500	1.34	1.41	1.40	1.37	1.66
	500-700	1.44	1.51	1.50	1.39	1.76
	700-950	1.75	1.83	1.76	1.63	1.94
	950-1200	2.18	2.29	2.12	1.84	2.18
	1200-1500	2.52	2.64	2.41	2.15	2.43
	1500-2000	2.85	2.99	2.68	2.45	2.70
	> 2000	3.52	3.70	3.32	2.95	2.98

Table A 1: Average annual price data in US$ calculated from monthly data for the Cape hakes published in Globefish European Fish Price Reports. Note that the price data for headed and gutted frozen-at-sea product is provided for South Africa; none is reported for Namibia.

Appendix C

Reporting countries : 000 EUR		Partner countries : 388 South Africa						
Units : Metric Tonnes	Flow : Import	Statistical procedures : SP4						
Period Products								
	3026966		3037811		3042055			
	mass mt	nominal catch[1]	mass mt	nominal catch[2]	mass mt	nominal catch[3]	mass of nominal catch exported to EU	%total nominal catch exported to EU
1997	10655	11720.5	11888	17356.48	7077	14826.32	43903.295	30.69044473
1998	9570	10527	11205	16359.3	9106	19077.07	45963.37	31.32940495
1999	14625	16087.5	11838	17283.48	8561	17935.3	51306.275	36.98122693

[1]conversion factor 1.10 applied for head on gutted
[2]frozen hake, not fillets, assumed to be headed and gutted, therefore conversion factor of 1.46 is used.
[3] half mass assumed untrimmed skin-on with conversion factor 1.94, half assumed trimmed skinless with conversion factor of 2.25

Table A 2: Mass of EU imports of hake from South Africa in mt, based on data extracted from Eurostat database, COMEXT.

Reporting countries : 000 EUR		Partner countries : 388 South Africa			
Units : 1000 ECU	Flow : Import	Statistical procedures : SP4			
Period Products					
				total value SA export to EU	
	3026966	3037811	3042055	Total '000 euro	ZAR million
1997	31485	18951	17701	68137	354.9597
1998	31168	17800	24287	73255	454.2543
1999	47319	21070	25732	94121	613.6689

1997 1ECU=R5.2095
1998 1ECU=R6.201
1999 1ECU=R6.52

Table A 3: Value of EU imports of hake from South Africa in '000Euro, based on data extracted from Eurostat database, COMEXT.

Actual and estimated costs per kg of transportation and related costs between South Africa and Spain					
Year	RSA Shipment	RSA Warehouse out	RSA insurance	Total	%increase over previous year
2002	2.97	0.55	0.06	3.58	10.83591331
2001	2.69	0.50	0.04	3.23	11.76470588
2000	2.38	0.47	0.03	2.89	10
1999				2.63	10
1998				2.39	10
1997				2.17	

Table A4: Actual (2000 –2002) and estimated costs (1997-1999) per kg of transportation and related costs between South Africa and Spain.

Gm per piece	offshore 1998 tonnes	inshore 1998 tonnes	total 1998	% in size category in 1998	estimated mass per size category in kg in 2002	US$/kg[2] March 2002	[1]ZAR/kg Mar2002	Value of each size category in ZAR millions
950-1300	24817.14	1258.79	26075.93	29.2	25329108	3.82	43.91	1112.1
750-950	5263.36	338.05	5601.41	6.3	5440982.5	3.42	39.31	213.9
680-750	2751.7	262.97	3014.67	3.4	2928331.9	3.29	37.82	110.7
550-680	5110.3	488.37	5598.67	6.3	5438322.1	3.07	35.29	191.9
350-550	13208.5	1318.83	14527.33	16.3	14111258	2.72	31.26	441.2
250-350	15368.00	1408	16776.00	18.8	16295528	2.46	28.28	460.8
<250	17282.00	339	17621.00	19.8	17116327	2.32	26.67	456.4
	83801	5414.01	89215.01	100.0	86659858			2987.000

1. SA Reserve Bank average rate for March 2002 used: US$1=ZAR11.494. Jan 2002 US$1=ZAR11.608.
2. Average prices for March 2002, Globefish European Fish Price Report, 15 March 2002 – No. 03/2002

Table A 5: Calculation used in estimating value of 2002 headed and gutted portion of hake catch using March 2002 ex-coldstore Spanish prices.

	landed mass in tonnes 1997			landed mass in tonnes 1998		
	inshore	deepsea	total	inshore	deepsea	total
hake 5	638	11766	12404	708	12725	13433
hake 4	1432	14258	15690	701	15390	16091
hake 3	1436	12569	14005	1127	11793	12920
hake 2	1330	10134	11464	1131	11243	12374
hake 1	898	15750	16648	1408	15368	16776
hake 6	195	10176	10371	339	14858	15197
hake 0	0	2819	2819	0	2424	2424
total h&g	5929	77472	**83401**	5414	83801	**89215**
	landed value in '000 ZAR 1997			landed value in '000 ZAR 1998		
	offshore	inshore	total	offshore	inshore	total
hake 5	51594	2798	54392	58599	3260	61859
hake 4	62521	6279	68800	70871	3228	74099
hake 3	52828	6036	58864	52043	4973	57016
hake 2	34597	4541	39138	40306	4055	44361
hake 1	35532	2026	37558	36422	3337	39759
hake 6	18836	361	19197	28869	659	29528
hake 0	5218	0	5218	4710	0	4710
total	261126	22041	**283167**	291820	19512	**311332**

1. Broken hake excluded from total

Table A 6: Total landed mass and landed value.

PART II

ASSESSMENT OF THE ECONOMIC BENEFITS MOZAMBIQUE RECEIVES FROM THEIR SHALLOW WATER SHRIMP FISHERIES

Assessment of the economic benefits Mozambique receives from their shallow water shrimp fisheries

1. Introduction

Determining the potential resource rent of a fishery is a non-trivial task. It involves several problems on different levels on both the biological and the economic side. In order to assess biological potential, knowledge of growth pattern, recruitment dynamics and natural mortality is needed. Fishing mortality can interfere with other biological processes in complex ways.

Fishing mortality often is estimated by assuming linear relationship between fishing effort and fishing mortality. This simplification in many cases has severe consequences in management since non-linear relationship causes relative efficiency between vessels to be functions of stock abundance or other biological variables (such as age structure, seasonal variables, condition factors etc.).

Consequently vessels being the most cost efficient during one period may be different from the ones being most cost efficient during other periods of different stock abundance. Therefore it is necessary to investigate the production process in details when potential resource rent in a fishery is to be estimated, since the optimal stock size (which will be reflected in stock abundance) often is very different from the current stock size.

On the other hand, in the case of an open access fishery (where the stock size usually will be much lower than in the optimum situation), real unit cost of fishing effort is easier to estimate than what would be the case in situations providing positive resource rent. In case of the latter the tendency of increased unit cost of effort over time in cases of having super-normal profits (resource rent) has to be taken into consideration. The problem of capitalisation of super-normal profit is naturally not present in an open access situation, unless in cases of intra-marginal rent.

In the long run open access fishery will lead to a selection of the most cost efficient operators. In this context cost also includes opportunity costs and low unit cost of effort might reflect a high degree of specialisation and lack of alternatives rather than extraordinary efficiency. Therefore an analysis of the open access solution is not necessary a useful reference point for an evaluation of the optimal situation and an estimation of potential resource rent of a fishery.

The fishery to be focused in this article, the Sofala Bank shallow water shrimp fishery, includes all the above-mentioned considerations regarding the problem of estimating potential resource rent. Over a period of 25 years the fishery has developed a high profitability which led to a steep increase in effort and a corresponding decline in catches until a historical low level of 5.7 thousand tonnes was reached in 1990, before the introduction of closed season regulation improved the situation.

This shrimp fishery is by far the most important Mozambican fishery in terms of export value and influx of foreign currency, with an export of 8,000 tons worth 70 millions US$ in 1999 (Degnbol et.al., 2002). Seafood products have for many years constituted the largest export from Mozambique. Shrimp dominates the seafood export totally, covering 87% of the

quantity and 93% of the value of the total export in 1998. The most important markets with the most attractive price are EU and the Japanese market. These markets are reached through processing companies vertically integrated with companies involved in the joint venture companies participating in the industrial shrimp fishery. The shrimp is exported frozen.

2. Brief history of the fishery

Foreign fleets have been fishing shrimp on the Sofala Bank outside territorial waters at least from 1964 and probably several years earlier (de Almeida and Santos, 1991). Industrial development of the Mozambican fishery did not start until 1978, at that time the EEZ of 200 nautical miles was introduced. The government considered Mozambican ship owners and fishing industry to lack the necessary technical capacity and know-how in developing the shallow water shrimp fishery and joint venture fishing companies with foreign interests were established (de Almeida and Santos, 1991 and 1997).

Potential annual maximum sustainable yield was calculated to be in the range of 14,000 tonnes in a preliminary assessment covering the period 1974-1976 (Ultang, Brinca and Silva, 1980). This early estimates soon showed to be far too optimistic. The catch and effort development of the fishery can be read from Table 1. It shows a considerable increase in fishing effort, measured in standardised fishing hours based on the Vega vessel group, while the catch has been slightly reduced but fairly stable over the last 20 years.

Table 1. *Catches, standardised effort and catch per effort (CPUE) and stock estimates in the Sofala Bank shallow water shrimp fishery 1980-1999. The table is including industrial and semi-industrial sub-sector. Incidental catches of artisanal sub-sector are probably low and ignorable. See body text below for details.*

Year	Catch (tonnes)	Effort (std.Vega hours)	CPUE (kg/hour)	Average stock biomass (tonnes)
1977	9,500	102,000	93.1	7,989
1978	9,600	112,000	85.7	7,388
1979	8,778	137,000	64.1	5,498
1980	8,007	138,052	58.0	4,983
1981	9,377	146,516	64.0	5,498
1982	7,908	155,059	51.0	4,381
1983	8,101	207,718	39.0	3,350
1984	8,205	195,357	42.0	3,608
1985	8,128	172,396	47.1	4,038
1986	7,720	175,455	44.0	3,772
1987	7,206	167,581	43.0	3,674
1988	7,290	169,535	43.0	3,550
1989	5,807	165,914	35.0	2,954
1990	5,668	195,448	29.0	2,496
1991	6,967	217,719	32.0	2,746
1992	6,332	204,258	31.0	2,660
1993	6,696	216,000	31.0	2,660
1994	6,321	222,177	28.5	2,446
1995	7,344	254,047	28.9	2,480
1996	7,221	270,053	26.7	2,114
1997	8,419	278,190	30.3	2,509
1998	7,861	313,000	25.9	2,241
1999	8,114	315,000	25.8	2,310

Based on Degnbol et.al. (2001) and Eide et.al. (1993).

The Sofala Bank Shrimp Fishery is a mixed species fishery, *Penaeus indicus* and *Metapenaeus monoceros* are the two most important species, constituting for about 80-90% of the total catch. The life span of these species is about 18 months with an annual marginal mortality rate of 2.16 (Eide, 1992). The catch of other species (*P. japonicus, P. latisulcatus* and *P. monodon*) has increased to about 20% of the total catch since 1992 as a result of increased fishing at night (Caputi, de Sousa and Dias, 2000).

The recruitment and growth of the main species, in particular the white shrimp (*P. indicus*) have a significant seasonal pattern, which makes closed season regulation very efficient. Catch per hour the first month after closed season is 5 to 10 times the catch per hour obtained in November and December (Caputi, de Sousa and Dias, 2000). The recruitment of the white shrimp (*P. indicus*) has a significant seasonal pattern while the brown shrimp (*M. monoceros*) recruitment seems to be more constant throughout the year (Eide et.al., 1993). The shrimp recruitment possibly is related to the fresh water outflow, in particular from the Zambezi River (Gammelsrød, 1992).

3. History of Management

Usually the shallow water shrimp fishery of Sofala Bank is separated into three sub sectors; the artisanal, the semi-industrial and the industrial sub-sectors. Today two latter are controlled by catch quota regulation (on company), limited entry regulation (which is closely linked to the catch quota regulation), minimum mesh size regulation and closed season regulation. Apart from subsistence fishery the artisanal sub-sector in principle are regulated by a minor entry fee. Assessments of the artisanal beach seine shrimp fishery have been carried out in the late 90-ies and showed incidental catches of paeneids in the range 60-300 tonnes per year, or 1-3% of the total catch of the industrial fleet (Caputi, de Sousa and Dias, 2000). The biological consequences of the insignificant artisanal catches can be neglected.

Table 2. *Quotas and catches of shallow water shrimp separated on industrial and semi-industrial sub-sector for the period 1995 – 2001 Data are retrieved from the official web site of the Ministry of Fisheries, Mozambique, http://www.mozpesca.org. Artisanal catches of paeneid are neglectable and not quota regulated.*

Year	*Quota*		*Catch*		
	Industrial sub-sector	*Semi-industrial sub-sector*	*Industrial sub-sector*	*Semi-industrial sub-sector*	*Total*
1995	Na	-	7,344	157	7,501
1996	Na	-	7,043	396	7,439
1997	7,462	-	8,239	514	8,753
1998	7,650	-	7,172	976	8,148
1999	7,940	1,645	6,971	1,474	8,445
2000	7,750	1,505	7,419	1,721	9,140
2001	Na	na	7,730	1,566	9,296

Quota management was first introduced on the regulation of the joint venture industrial fleet and the semi-industrial fleet was included in 1999 (Table 2). Already in 1977 total fishing effort exceeded 100,000 standardised fishing hours (Vega hours) with a corresponding catch of 9,500 tonnes. From 1977/1978 annual catches dropped down to less than 6 thousand tonnes

and have lately stabilised around 8 thousand tonnes. The total effort has increased steadily over the period and is today three times the effort of 1977 (Table 1). According to Silva et.al. (1992) and Watson (1999) catch quotas often are set at levels higher than recommended by the Marine Research Institute (IIP) and are not being achieved (as indicated in Table 2).

Mesh size regulation was introduced in 1985 and minimum allowable mesh size today is 60 mm (Table 3). Since increased mesh size in the short run reduce catches, catch per unit effort and hence gear efficiency is also reduced. Data of Table 1 therefore should be compared with the information given in Table 3.

Table 3. *Minimum mesh size in the industrial shrimp fishery. From Silva et.al. (1991) and Watson (1999).*

Period	*Minimum mesh size*
1985 - 1989	37 mm
1989 - 1990	37/45 mm
1990 - 1994	45 mm
1994 -	60 mm

Closed season regulation was introduced in 1990/1991, closing the fishery in December and January, after a 25% closure of the same months the year before (Silva et.al., 1991). Closing December had no significant impact while the January closure was crucial. Already next year Silva et al (1992) proposed a three-month closure, January, February and March. The two-month closure has from 1992 been covering January and February and from 2001 in addition first half of March. Taking this considerable closure into account, the monthly fishing pressure in the fishing season, has been increasing much more than reflected by the annual figures of total effort shown in Table 1.

The main contribution of the closed season regulation is a more profitable fishery the period very short after opening (March-April). This increased profitability creates a pressure towards higher fishing effort during this period in order to take advantage of the high catch rates. Due to significant decline in profitability later in the fishing season, less efficient vessels have not been able to make profit even after the introduction of closed season. This probably is the reason why the long lasting increase of total effort has had no significant impact on catch rates, which have been fairly stable during the nineties (Figure 1).

The seasonal pattern, probably caused by the seasonal fresh water flow, together with the short life span of the resource, are the reasons why the closed season regulation in this fishery has a particular strong effect (Eide et al., 1993). The profitability late in the year is close to zero or negative while the first period after closure is determining the total annual profitability. Closing December in addition to January and February therefore has no significant effect. December has never been a very profitable month of this fishery. Model simulations have shown a substantial positive effect both on catches and profitability of increasing the period of closure to the end of March (Eide et al., 1993). Quota regulation has not proved to have any important effect on the total profitability of the fishery. Even though quota regulation seems to be less important than closed season regulation in the shallow water shrimp fishery, most attention has been put on the first. The reason of this is obviously related

to the fact that the distribution of quotas also represents a distribution of resource value on companies.

The Mozambican government in 1995 approved the Master Plan of the fisheries sector, which was commenced in 1992. This policy document gives priority to the development of land-based fish processing plants in combination with a stronger emphasis on the semi-industrial fleet. As a result of this by the late nineties ice-carrying semi-industrial trawlers was introduced in the Sofala Bank shrimp fishery. In 1998 28 new semi-industrial vessels were given licence to operate in the shrimp fishery at the Sofala Bank (Degnbol et al., 2002).

Partly because of the lack of sufficient capacity of processing plant approved for export to EU and partly because of the lower profit of land-based solutions, on-board freezing facilities on the semi-industrial trawlers was soon accepted. The potential gain of processing the shrimp could also be questioned, as the raw product (frozen shrimp) has a very high market value, also compared with processed products. By October 1999 four land-based seafood-processing plants and 31 on-board producers (companies, many of them owning more than one vessel) had been approved for export to the European Union. The distinction between semi-industrial and industrial trawlers was based on a length criterion without considering the type and amount of onboard equipment (e.g. freezers). From 1997 semi-industrial trawlers were allowed to have freezers on board. Paeneid shrimp is exported frozen as an unprocessed product. The effect on the land-based industry is therefore almost absent in a situation where quota holders hardly use freezing facilities on land for other purposes than storage units before export.

The shrimp stocks were heavily exploited already before the entrance of the new semi-industrial fleet, as can be seen from Table 1. The increase of the semi-industrial sub-sector did not lead to a correspondingly decreasing the capacity of the industrial sub-sector, which was considered as a necessary condition in the Master Plan. The problem of overcapacity is worsened and may seriously affect the possibilities of future profitability for the involved companies and also for the Mozambican government.

The Marine Research Institute of Mozambique (IIP) has over a number of years recommended a reduction in fishing effort down to 180 000 standardised hours (Caputi, de Sousa and Dias, 2000). IIP differ between standardised hours and the new standardisation unit standardised day hours, since a lower catch per unit of effort is obtained by night than by day. Even when taking this into consideration, the effort figures of Table 1 reflect a huge over capacity compared with the recommended effort. As seen from the table the increase from mid nineties up to now is nearly 100 000 fishing hours, mainly caused by the increase in the semi-industrial sub-sector.

As noted in the introductory part the relationship between fishing effort and fishing mortality is assumed to be constant in most fisheries. This is also an assumption used in the current management regime of this fishery (Watson, 1999) even though one earlier study proves this not to be a correct assumption. Eide et al (1993) estimates an increase in catch by 0.24-0.87%, depending on species and fleet (in all cases significant different from 1%), when stock biomass increases by 1% (Table 4). The low values of stock-output elasticities reflect important properties of keeping relatively stable catches in situations where stock abundance is changing. The fleet has therefore also a low potential of taking advantage of higher stock abundance. Changes in the CPUE-values over a period of years may therefore not reflect the full variation in stock biomass over the same period.

Table 4. *Stock-output elasticities of six vessel groups, calculated on the basis of monthly catch and effort of each vessel in 1992, assuming a Cobb-Douglas production function and a effort-output elasticity equal one (Eide et al., 1993).*

Vessel group	*Penaeus indicus*		*Metapenaeus monoceros*	
	Females	*Males*	*Females*	*Males*
Mosopesca	0.8061	0.6275	0.5315	-
Antares (Efripel)	0.8412	0.8784	0.6404	0.5568
Vega (Efripel	0.6466	0.7404	0.6799	0.5140
Arpem (Pescamar)	0.7131	0.7366	0.5348	0.2473
Pescamar	0.6513	0.6779	0.5242	0.1958
Crustamoz	0.6511	0.8294	0.5284	0.3858

From Table 4 it is seen that the stock-output elasticities are slightly higher for the brown shrimp than for the white shrimp. The same pattern can also be observed between the vessel groups of the two companies Efripel and Pescamar. In particular it is interesting to note that all the Pescamar vessels are having very low stock-output elasticities in the brown shrimp (*M. monoceros*) fishery compared with the standardising vessel group Vega (which belongs to Efripel company). This also illustrates the problem of implementing a specific standard assuming linear relationship. According to the stock-output elasticities of Table 4 changes in CPUE-values by 5-8% roughly reflects changes in stock biomass by 10%, or more in the case of the brown shrimp. The error added by the standardisation method will probably increase the relative difference between the CPUE-values and stock biomasses.

4. Economic key numbers

It is stated in the Master Plan that the aim of governmental fisheries policy is to achieve full cost recovery of fisheries administration (by 1996) and to achieve financial autonomy in the fishing sector by relating the costs of the various aspects of the fisheries administration, including research and management, to a certain percentage of the primary value of landings. A public cost and revenue analysis of the fisheries sector has not been carried out yet and an overall balance is difficult to obtain. Some very rough figures from Degnbol et al. (2002) indicate that full cost recovery has been achieved. The following analysis is based on Degnbol et al. (2002).

The overall income from licenses in 1999 was 36 billion Meticais (Industrial fisheries 21,8, Semi-industrial 8,6 and tuna 5,8), or close to 2 millions US$. Compared with the annual budget provision of 4.5 millions US$ indicated for 1999 in the Master Plan, this is a modest contribution from the largest Mozambican fishery. An increase in the quota prices has however been implemented. Export tax was earlier 5% on export value, but this tax was removed in 1993 in order to create better conditions for export. Export taxation as before 1993 would potentially bring more than twice as much back to the Mozambican government as license fees did in 1999 (Degnbol et al., 2002).

As the only joint venture companies influenced and operated by foreign companies, Efripel and Pescamar are subject to a taxation regime that differs from all others. Efripel and Pescamar alone have according to Degnbol et al. (2002) paid around 60 billion Meticais (more than 3.5 million US$) in a special tax on exploration of natural resources (Taxa de Exploracao dos Recursos Naturais, TERN). The tax is calculated on basis of operation costs and not on profit as in the case of the other companies. There is no other tax on any measure of effort, such as fishing days, trawling hours etc. Tax on ordinary company profit is assumed to follow standard taxation rules. The practise of profit taxation results in insignificant income to the government due to the possibilities particularly the international companies have to move surplus to take advantage of different taxation regimes. Degnbol et al. (2002) estimated overall revenues from fisheries to be in the range of 100 billion Meticais or 6 million US$ in 1999. In the same study the overall budget of the Ministry of Fisheries including the fisheries administration, IIP, IDPPE and the Fisheries School was estimated to be in the order of 25 billion Meticais in 1999.

As in most countries the expenses of the Mozambican fisheries administration is not directly linked to the income generated by the fisheries. The fisheries institutions are financed directly from the treasury, which also receives 40% of the licenses from the Fisheries Promotion Fund (FFP, which receives and redistributes 50% of the license income), and from the 10% share of licenses attributed directly to the body collecting the license (Ministry of Fisheries). In 1999 the licence fees were 218 US$ per ton in the freezer fleet, which includes the whole industrial and some in the semi-industrial sub-sectors, and 2553 US$ a year for the remaining vessels in the semi-industrial sub-sector.

Cost recovery is a minimum requirement in the Master Plan where it is stated that the private sector should be the principal contributor towards the improvement of the national economy. For those fisheries operating under the standard license system, the levy paid on a catch quota of one ton of shallow water shrimp is 3.6 million Meticais or 0.22 US$ per kilo. Compared to a price on the major export markets in the range of 9 US$, this is about 2.5% of the value (Degnbol et al., 2002). Before the joint ventures were introduced license fees on foreign vessels were in the range of 20% of the international market value. The reduction of Mozambican share based on the licence fees could partly be compensated by taxation on fishing effort (production cost) of Efripel and Pescamar, but it can be questioned if Mozambique presently are receiving full benefits from its rich fish resources. This figures show that full cost recovery is indeed achieved but also that the contribution from this fishery probably could be increased substantially. In order to analyse this potential, the particular biological properties of the resource should be more thoroughly investigated.

5. Resource rent

In a normal fishery two main factors have the potential of creating super-normal profit. The first is related to the simple fact that the natural resource is produced by nature for free (disregarding the fact that some opportunity cost could be put on the natural input factors). In the case of an open access shrimp fishery this means that the shrimp is produced for free and the only cost of bringing it to the market is related to the process of catching it and transporting it. This cost will of course depend on how easy it is to find and catch the shrimp, which could be described by shrimp abundance. In the case of a positive shadow value of shrimp in nature, this represents a classical market failure.

The second factor is related to the first. Before shrimp can be sold in a market, two input factors are needed. The first is shrimp in nature, the second is the sum of capital and labour needed to produce the fishing effort necessary for catching the shrimp and bring it to the market. In this case the first has no price; it is free. To put it into market terms: The supply curve of shrimp in nature is a price of zero for all quantities. Therefore the demand for shrimp is higher that the supply always as long the fishery can produce a positive net value.

A complicating factor here is the interrelationship between the two input factors, shrimp in nature and fishing effort. In the long run an increase in fishing effort will reduce the stock size of shrimp in nature. Since sustainable annual supply cannot be higher than annual net production of shrimp, the gap between demand and supply will exist until the cost of unit production reach the unit price in open access equilibrium.

The market failure makes it however possible to harvest an economic rent equal the shadow value of the stock in nature, often referred to as resource rent. Other economic rents, intra-marginal rent and monopoly rent, might also occur in fisheries. In fact resource rent could be converted into monopoly rent, as when a single owner (e.g. a government) takes the advantage of being a monopolist.

Substituting biomass by fishing effort in order to keep the catch production constant, leads to a further decrease in stock size (biomass) because of the long-term interrelation between the two input factors. Hence an increase in fishing effort is necessary in order to keep the production level when stock size drops. This explains the classical problem of over-fishing, as a long-term equilibrium will exist where unit cost of catch equals average revenue (price). In the case of the shallow water Sofala Bank shrimp fishery other factors also turn out to be essential in order to give a full understanding of the economic potential of the resource.

The significant impact of closed season regulation and the lasting problems other companies than the two main ones experience in making super-normal profits, illustrate an important characteristic of this fishery. The first days after opening, catches and profitability are very high. At the end of the year it is hard to obtain profit because of low catches and the companies reduce their activities in order to avoid or reduce losses. The most efficient companies are those who are able to obtain the highest quantities during the first month after the closed season. It can therefore be argued that the total capacity of effort should be high, even though the capacity will not be used later in the year.

In order to cover the cost of a large overcapacity later in the year, high efficiency during the most profitable period is necessary. The only companies successful in this are Efripel and Pescamar. The resource rent of the first weeks after closure subsidise overcapacity the rest of the year. Companies not having this ability will not be able to build up the necessary capacity to collect recourse rent at all. Probably it is both a matter of efficiency and scale. History and skilled crew plays also probably a role here. The failure of developing the semi-industrial sub-sector within this fishery also has to be view in the light of these considerations. It is therefore likely to believe in a reduction of the overall resource rent if the capacity of the two main companies is reduced, even though this could give more space for the semi-industrial fleet. This is also the reason why the quota regulation is not effective, as can be seen from the figures in Table 2. In this particular fishery the problem of large quotas does not seem to be a hindrance for the companies in obtaining resource rent. The simple explanation is the highly seasonal pattern of the stock abundance combined with a correct timing of closed season.

Profitability simply cannot be ruined by mismanagement as long as a closed season regulation is put in place.

6. Theoretical resource rent estimation

Assume a production function of the Cobb-Douglas type where catch,

$$h(E,X) = q \cdot E^{\alpha} \cdot X^{\beta}, \tag{1}$$

is a function of fishing effort, E, and stock biomass, X. q is an constant reflecting stock abundance and the two other parameters, α and β, are respectively the effort-output elasticity and the stock-output elasticity. The non-linear relationship between fishing effort, E, and marginal fishing mortality, F, is easily shown to be

$$E = \left(\frac{F}{q} \cdot X^{\beta-1} \right)^{\frac{1}{\alpha}}, \tag{2}$$

as the marginal catch (equation 1) equals the product $F X$. The stock effect of fishing effort can be expressed as a function $X(E)$, involving the non-linear relation between F and E (equation 2).

Further assume a revenue equation

$$tr(E,X) = p \cdot h(E,X), \tag{3}$$

where p is a constant unit price of harvest. The total cost is assumed to be linear in effort

$$tc(E) = a \cdot E, \tag{4}$$

a being the unit cost of effort.

According to standard bioeconomic theory the long-term open access solution is derived from

$$\frac{tr(E_{OA})}{E_{OA}} = tc'(E_{OA}),$$

which gives the equilibrium stock solution of open access to the fishery,

$$X_{OA} = \left(\frac{a}{q \cdot p} \right)^{\frac{1}{\beta}} \cdot E_{OA}^{\frac{1-\alpha}{\beta}}. \tag{5}$$

Correspondingly the maximum economic yield equilibrium is found where the marginal revenue equals the marginal costs,

$$tr'(E_{MEY}) = tc'(E_{MEY}),$$

remembering that the stock biomass is function of effort; *X(E)*. The problem can be expressed by the differential equation

$$\frac{a}{q \cdot p} = E_{MEY}^{1-\alpha} \cdot X(E_{MEY})^{\beta-1}(\alpha \cdot X(E_{MEY}) + \beta \cdot E_{MEY} \cdot X'(E_{MEY})). \qquad (6)$$

The solution of the differential equation depends on the long-term stock effort relationship or the population dynamics of the stock. A general solution including equilibrium effort could however be found by employing the integration constant, *C*

$$X_{MEY} = E_{MEY}^{-\frac{\alpha}{\beta}} \cdot \left(\frac{a}{q \cdot p} \cdot E_{MEY} + C \right)^{\frac{1}{\beta}}. \qquad (7)$$

The integration constant *C* represents all long term stock impact of effort. Notice that equation (5) equals equation (7) in case of *C*=0.

Table 5. *Price, cost and catchability coefficients (q) of fleet groups of the main operators in 1992. q-values of brown shrimp are also available but are not included here (from Eide et al., 1993).*

Company	*Unit price of harvest (US$ per kg harvest)*	*Fixed cost (1000 US$ distr. on fishing day)*	*Variable cost (1000 US$ per fishing day)*	*Catchability coefficient (times 100, monthly) (White shrimp)*
Efripel				
Antares	3.16 - 14.72	2.00	3.00	0.0578 - 0.1236
Vega	3.16 - 14.72	2.00	3.00	0.1203 - 0.1717
Pescamar				
Arpem	9.25	3.38	4.20	0.1441 - 0.1670
Pescamar	9.25	4.95	8.16	0.2564 - 0.2682

Prices and cost of harvest for the main companies are shown in Table 5. Indicators suggest that the level of prices and costs has not changed substantially since 1992 (Almeida and Santos, 1997 and Degnbol et al., 2002).

Based on the fact that shrimp catches are commodities traded in an international market, the differences in obtained prices are surprising. Both companies are however vertically integrated in big international organisations where harvest and processing units operates in internal markets. Internal pricing may explain differences of this kind. From Table 5 substantial differences in unit costs are also seen. Even though the vessel groups are not similar, the differences in unit costs are difficult to explain only by the physical differences of vessels and gears. It is however interesting to note that while Efripel is the one having the lowest prices, it is also showing the lowest cost. By that the profit of the two companies turn out to be almost the same and close to zero after taxation and fee payments.

If differences in costs and prices reflect different strategies in hiding obtained profit and resource rent, the fact that the companies have different strategies makes it possible to estimate hidden profits.

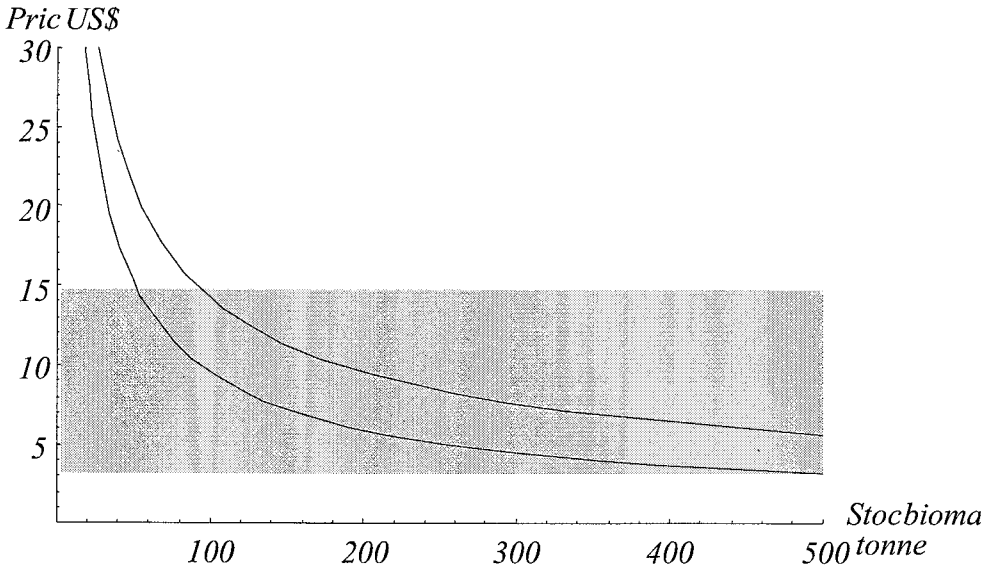

Figure 1. *Break-even price as a function of stock biomasses of white (lower curve) and brown (upper curve) shrimp in the fishery of the Vega group (Efripel), based on equation (5) and parameter values from 1992 (Eide et al., 1993), assuming α=1 and 20 fishing days per month. The shaded area represents the range of the market price (Table 5), which has to equal break-even values for full cost recovery.*

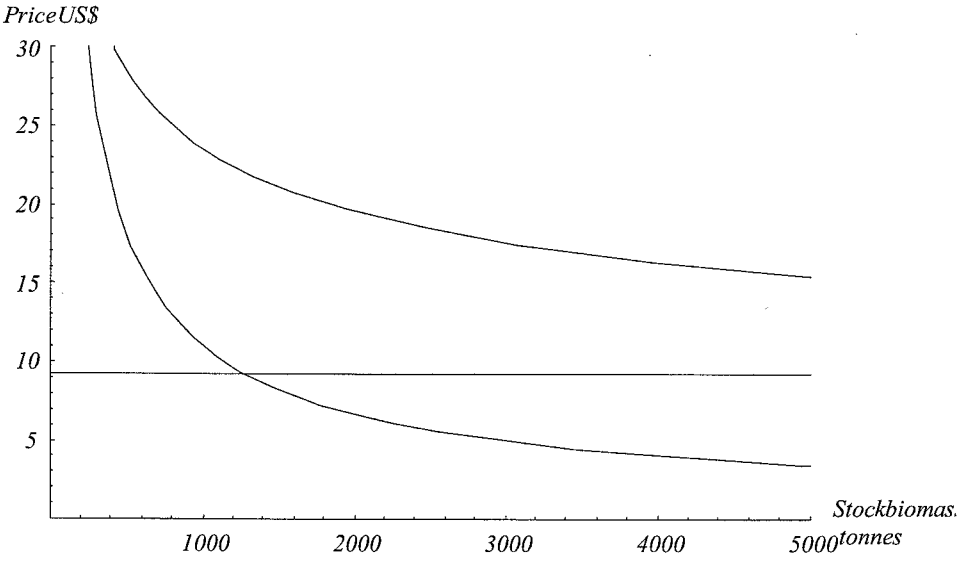

Figure 2. *Break-even price as a function of stock biomasses of white (lower curve) and brown (upper curve) shrimp in the fishery of the Arpem group (Pescamar), based on equation (5) and parameter values from 1992 (Eide et al., 1993), assuming α=1 and 20 fishing days per month. The horizontal line gives the market price (Table 5), which has to equal break-even values for full cost recovery.*

If hidden profit is in the range of the difference in obtained prices of the two companies, which is close to 2 US$ per kilo shrimp, a hidden profit is in the range of 16 million US$, or almost three times the Mozambican revenue received from this fishery in 1999 (se above). This suggests that the companies adjust prices or costs according to a full transfer of resource rent into their main organisation body. Since the resource rent received by the joint venture companies is transported through an organisation of vertical integration, it is not likely to be reinvested in the Mozambican fisheries in manner that make them less cost efficient. This refers to what is mentioned earlier on the problem of capitalising resource rent in a normal fishery.

Based on this rough estimates annual resource rent currently obtained could be in the range of 20 million US$ or more. It is however not clear if this is far from the maximum potential resource rent or not. The fast changes in stock abundance during a year gives a very short period of high profitability of this fishery, illustrated in figures 1 and 2. The implementation of closed season regulation has therefore probably a much greater impact on the profitability than any other regulations of fleet activity. The value of the integration constant of equation (7) involves stock dynamics without long lasting periods of stable stock abundance. Since the cost of producing corresponding fluctuations in fleet capacity is high, an equilibrium level of effort will probably exist where resource rent still can be obtained without any other regulations than closed season management.

Given an annual resource rent π and an interest rate r, the present value (PV) of an infinite flow of such annual super-normal profit would be

$$PV = \sum_{t=1}^{\infty} \frac{\pi}{(1+r)^t} = \frac{\pi}{r}.$$

In the case of an annual resource rent of 20 million US$ and interest rate of 10%, this gives a present value of 200 million US$. This could also be regarded as an estimate of the total value of the Mozambican holding company Emopesca, which was established by the Mozambican government as the national partner in the joint venture companies. As long as Emopesca is a partner in the ongoing joint venture companies and the current share of 49/51 remains, the value of the Mozambican share should be close to 100 million US$, equal the value of the interest the foreign companies have in this fishery, Efripel and Pescamar.

7. Conclusion

Even though the shallow water shrimp fishery from the manager's point of view is considered remain in a critical situation after a history of negative CPUE development, resource rent is still produced. The annual export value is 70 millions US$. The impact of the closed season management is significant and sufficient to secure super-normal profits (resource rent), while other management means more are representing costs rather than improving management. In particular the quota regulation seems to have no significant effect. The fluctuations in stock abundance in this fishery, mainly driven by the recruitment of the white shrimp, seems to ensure a super-normal profit as long as closed season management is put in place.

Currently the total annual resource rent probably is in the range of 20 million US$ of which 5 - 6 million US$ is the Mozambican revenues from the fishery. This is sufficient for providing a full cost recovery for the Mozambican fisheries administration, but potentially the income could be 3 or 4 times higher.

The holding company Emopesca is the most important tool of increasing the resource rent from the shallow water shrimp fishery for the benefit of Mozambique. The short-term task is to develop methods to estimate and reallocate resource rent obtained by joint venture companies. In the long run it should be possible to develop competence and skilled personnel nationally to ensure national exploitation of these valuable resource.

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