

Avoiding One Fishermen – A case of Namibia

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Abstract

The open access nature of fisheries resources had caused application of excessive fishing effort to most World fisheries. Proper management of fisheries resources is vital for sustainability and its safe future utilisation. Most attempts to salvage fisheries resources had so far succeeded but have also created one or more problems. This led to some writers suggesting that the fishery management itself should not be perfect as the World in which it operates is itself imperfect.

The reflection on the historical background and the development of the Namibian fisheries management is presented. The effectiveness of the management system is examined by assessing the achievements attained. Problems of ITQ management system are reviewed with particular reference to concentration. Furthermore, the justification for not using pure ITQ in the Namibian context is made. The results prove that concentration, which in part is one of the main problems of ITQ, is non-existent in the Namibian fishery.

INTRODUCTION AND FISHERIES PROBLEMS

Under open access, the fishery resources are not regulated and every one can exploit the resource as they so wish. The fisherman fishing under open access has no incentives not to harvest the fish today because there is no assurance that the conserved fish would be available for his harvest in future. Instead he is encouraged to catch more fish as quickly as possible because he competes with other fishermen for a limited resource (Hannesson 1993). In addition, potential fisherman outside would be willing to enter the fishery as long as there are profits to be made.

Addressing the common property nature of the fishery resources required several management measures to be undertaken. Management measures in the form of input and output control has been used in addressing the levels of effort, which arise due to the common property nature of the fishery resources. Hannesson (1993) has explored the ways in which the fishing industry may be controlled in an incentive-efficient and incentive-compatible manner. These include indirect controls by taxing fishing effort, controlling fishing capacity as well as controlling the catch. The most widely used management measure is ITQs because it is perceived to prevent the collapse of major stocks and hence make fishing more economic. In theory, the individual transferable quota system would accomplish the biological conservation and economic efficiency's management goals (Raizin, 1993). It has proven successful in generating resource rent, reducing capacity, quality improvement and achieving profitability.

However, although the problem of open access has been addressed, concern is raised regarding the level of concentration due to its transferability and the initial allocation that may arise due to the introduction of ITQs management system.

BACKGROUND OF NAMIBIA'S FISHERY

Namibia boasts one of the most productive fishing industries in the World because of the special climatic condition, which causes upwellings in the Benguella system. This condition provides an ultimate environment for pelagic fisheries.

Before independence Namibia's inshore fishery resources was managed by the South African regime while the offshore resources were managed through international collaboration under the International Commission for South East Atlantic Fisheries (ICSEAF). During this period, there were little or no surveillance activities for most fishing activities in the Namibian waters. The fishery was characterised by a large number of foreign vessels mainly long-distance trawlers, which started operating in Namibian waters in the early 1960s. These arrangements were mainly to Namibia's disadvantage as it resulted in fish stock depletion, less participation by Namibians and little economic benefits to its population.

After independence, the government was faced by two main problems of managing the fishery resource to sustainable levels and addressing the imbalances persistent at the time. The large part of economy was in the hands of a few mainly white people while the majority of the population mostly black had limited access to the core economic activities. The way in which fisheries are managed is stipulated by the Sea Fisheries Act (Act 29 of 1992). The introduction of the White Paper on fisheries policy was the first step towards setting policy goals and strategies of achieving the objectives. The Marine Resource Act 2000 made it illegal for the harvest of marine resources for commercial purposes to be undertaken without a fishing right. These policies were mainly centred toward rebuilding the stock, rebuilding the fishing industry, Namibianisation and empowerment. Namibianisation policy was meant to ensure that the benefits of rebuilding stocks and the fishing industry accrue substantially to Namibians. On the other hand empowerment is aimed to ensure that there is an increased participation and employment especially by the formerly disadvantaged Namibians

The right system limits the numbers of participants in commercial fishing while fishing levels are mainly managed by output controls in the form of TACs and input controls (capacity controls) in the form of number of vessels employed. The TAC is fixed every year by a mainly scientifically based assessment process that limits the amount of individual species to be harvested every fishing season, (Kidd, 2000). The durations of the rights are important to long-term investment decision-making, hence the introduction of 7, 10, 15 and 20 years rights were meant to ensure that industry could make long-term investment decisions with some level of assurance. The short-term rights are meant to measure the rights terms and conditions of being granted a right against the policy objectives. The length of the fishing rights is based on the level of investments in vessels, onshore facilities, Namibianisation and social investments.

FISHERIES MANAGEMENT

Theoretical considerations

Gordon was the architect of the theory of open access exploitation of the resources when he identified the absence of the property resource ownership or ill-defined ownership to be the root cause of the problem. It is widely understood among economists and fisheries scientists that the open access situation results in over-capacity and productive inefficiencies in the fishery, which in turn result to failure in fisheries management. This is stressed by (Palsson et al, 1996), acknowledging that the problems in resource management and bio-economics are subjected to the assumption that the current crisis in many fisheries is resultant of the open-access nature of the resources. Economists regard the lack of property right of the resources as a cause of market failure.

Fish stocks are depleted because of excessive capital and labour are devoted to fishing. The potential resource rent from the resource is dissipated and the crowded fishery diminishes the safety at sea and the quality of the fish delivered to markets.

The open access fishery can be exploited by everyone without restriction, therefore creating disincentives for any fishermen to apply conservative measures to a fishery that is open to all. Arnason (2002) further alluded to why the inexistence of property rights may force fishermen to overexploit the resources even against their better judgements. If access to fish is common, fishermen are compelled to extract large quantities of fish at faster rate possible without any regard to his impact on the future stock. Every fisher would upgrade his boats and increase effort, which is most likely to result in increased overall effort and possible decrease in profits. The race for fish may not only put the resource under pressure, but also imply that as the stock levels shrink there would be less or no economic incentives to encourage future fishing.

Individual Transferable Quotas

In recent years we have seen right-based management measures being developed to grant property rights to fishers. The most preferred management system is the ITQ¹, having been successfully introduced to countries such as Iceland and New Zealand in the early 1980s. The ITQ system is believed by economists to be the answer to the common property nature of fisheries resources. The theoretical literature on ITQs demonstrates the potential for productive efficiency and reduction in over-capacity in the fisheries. The reasons to justify these are given in Morgan (1997), in favour of reduced capacity and assured generation of economic rent amongst others. The ITQs success described by the introduction of property rights and the resultant reduction in the number of vessels as a social gain is based on the assumption that only the inefficient boats leave the industry. ITQs provide incentive to match capital investments to be on par with the amount of fish available for harvest. By guaranteeing a particular amount of fish (Raizin 1993) owners will seek efficiency by selling or buying quota allocations to match their operational capacity. In addition, ITQs have proven successful in improving quality and achieving profitability. Gissurarson (2000) amongst others is supportive of the opinion that the over-utilisation and non-exclusive nature of the fish resources may be resolved by the ITQ system and their exclusive nature means that only those who hold rights may harvest the fish resources. Furthermore, the individual ownership nature ensures that the responsibility for their utilisation lies with individual quota holders.

Although the harvesting right has promised to bring about notable improvement in resources rent generation, a doubt is expressed regarding the initial allocation, transferability, fairness, employment losses and corporate dominance (Peña-Torres 1998) and (Happert et al 1999). Brant (2005) has further stressed that ITQ produces gains through increased efficiency although it create fear amongst small fishermen who may be disadvantaged in favour of larger producers. If the policy objective is economic in nature, ITQs can be a solution to management problems, because efficiency is attained and economic rent is generated. However, fisheries management requires a multi-objective approach therefore concern regarding other socio-economic aspects should be considered. ITQs critics interpret the reduction in capacity as the fallout of the small producers from the fishery because they will face harsh economic realities while the larger producers who are normally vertically integrated into harvesting and processing would be encouraged to dominate the industry.

SOME PROBLEMS OF (ITQ) QUOTA MANAGEMENT

Quota management is faced with the difficulty in enforcing quota compliance as well as the discarding problem amongst other problems. In addition, fisheries management is a costly exercise, which makes it difficult for many countries to effectively enforce, especially poor countries. Substantial amount of resources are required to keep observers on-board and monitoring control and surveillance. Furthermore, the difficulty associated with enforcement is mainly applicable when enforcement is only done at the quayside rather than at sea. In the United States according to Huppert et al (1999), enforcement was intensified by using technology in the form of tagged cages to be used by every quota holder. In this way the enforcement is simplified since each right holder is monitored by the use of technology and would not exceed the allocated quota.

Discarding Problem

Discarding is especially heightened by the existence of high number of inferior catch (Arnason, 1993). The variability in prices of different sizes or types of fish motivates fishermen to dispose less valuable fish in the hope of maximising the gain from the quota share. Even though a good deal of discards is probably of low economic value, their large volume suggests a certain scope for sustainable landings. The problem related to discarding is mainly experienced in purse-seiners, which comprises of catches of pilchards and other pelagic species. Catches not suitable for canning are most often more to an extent they may lead to dumping. The same applies in the hake fishery where the catches of juvenile hake may result in discarding if no motivation for processing them into fishmeal is encouraged. Production of fishmeal to assist in fish farming and animal feed ensures that fish resources are not wasted (Arnason, 1998). While it is legal to discard unwanted fish in some countries in some it is illegal. In Namibia it is prohibited to discard any edible fish that may be caught in addition to the target specie. However, management measures such as gear type and mesh sizes are used to reduce the number of unwanted fish. In Namibia if a vessel is found to have caught a large share of juvenile fish is told to leave the area immediately.

Monitoring control and surveillance

The quota-managed fishery requires effective control to enforce management measures. Hannesson (1993) has demonstrated how the quota system has provided incentives for misreporting of catches in countries such Iceland, New Zealand etc. Practices of this nature are detrimental to management effort because they underestimate the actual catches and therefore affecting management decisions for future total allowable catches.

Fisheries management is characterised by enormous risks and uncertainties with regard to exact fish stock levels, environmental change, fisher's behaviours etc (Paradhan et al 2003). In addition the flow of information between stakeholders (fishermen and fisheries managers) in the fishery system is likely to contain errors, which in the end will lead to implementation errors. Uncertainties such as misreporting, discarding and fishers behaviours are some of the problems faced by fisheries managers, which has to be avoided by having proper enforcement measures in place.

Despite the monitoring control and surveillance in place the data collected and used for stock assessment, which is obtained from fishermen, may be subjected to deliberate errors. There were reported incidences of maltreatments and intoxication of fisheries observers' onboard fishing vessels. These behaviours are an attempt to hinder smooth operations by observers and facilitate the inefficiency of the monitoring operations therefore leaving room for non-compliance by vessel's skippers. The difficulties in implementing imposed restrictions are stated by Wilen (1979) that fisheries managers cannot necessarily impose restrictions and expect fishermen to fully comply. The ability of fishermen to adjust other factors to avoid imposed restrictions makes it difficult for enforcement.

In choice behaviour theory, Wilen (1986) and Naresh et al (2003) reveal that fishermen choice behaviour is dependent on economic or social factors. The decision related to what gear to use, the types of fish targeted and where to fish has an influence on fishermen's catch. In addition, fishermen's experiences, beliefs and preferences are most likely to be crucial in the way they do fishing. Economic factors, such as the expected catch returns and demand for fish are likely to greatly influence fisher's behaviour. Fishers are likely to employ the profit maximising behaviour by reducing their steaming time especially in times of high fuel prices. Hence in case of closing areas and seasons, proper monitoring would be required to ensure compliance.

Technological innovations can assist in right-based management either by providing us with enforcement technologies or by improving the ability of harvesters to harvest the targeted specific species and sizes. Electronic harvesting reporting equipment as suggested by Huppert & Knapp (1999) can prove to be a required method by which enforcement officers can monitor fishermen's harvest and ensure that they do not exceed the quota. In addition, monitoring and enforcement by uses of satellites, which involves visuals and radar detection of vessels by patrol vessels and airplanes, can be of increased importance.

EFFECTIVENESS OF NAMIBIAN MANAGEMENT SYSTEM

Measuring the performance of the management system in place with regard to the level of stock requires the availability of scientific information and is highly dependent on the methods used to measure such performances.

Despite the amount of charges to the government the Namibian fishing industry still remain highly profitable. This is demonstrated by the fact that the TAC levels had been adhered to in most cases, therefore not raising questions of serious over-catching. Although it is argued that non-tradable quota increases incentives to over-catch the allocated quota as well as encouragement of discarding (Hatcher et al 2002) in multi-species fisheries, it is totally the opposite for the Namibian fishery. Generally there is a notable improvement in resources stock compared to period before independence when the stock was heavily over-exploited by distance water fleets. The notable reductions in catches after independence are mainly due to environmental conditions and not because of declining biomass.

Namibianisation

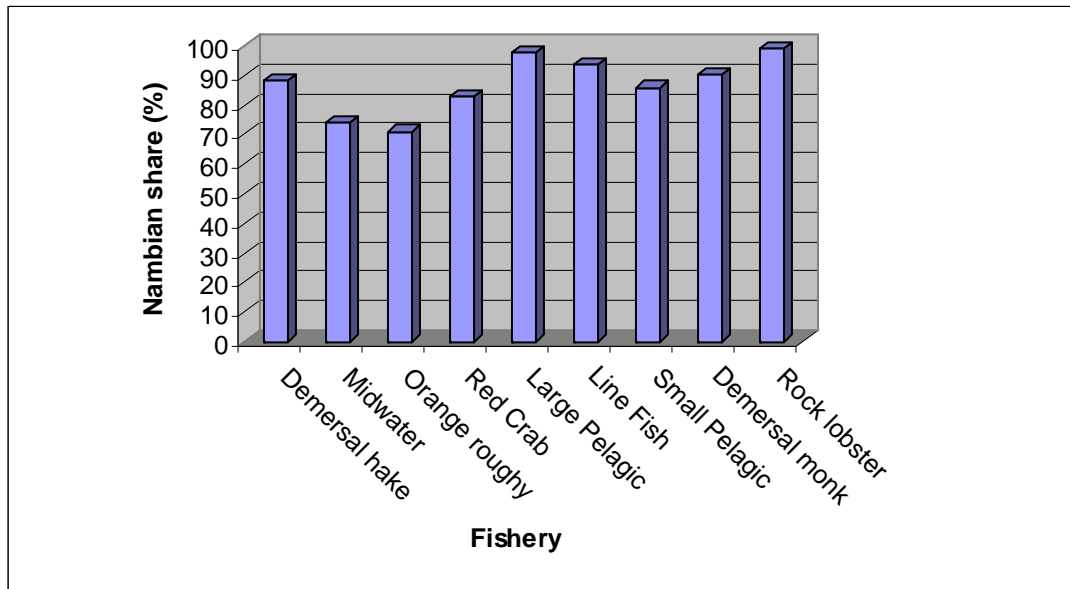


Fig: 1. The performance of Namibianisation

Namibianisation and empowerment of formerly disadvantaged Namibians has been achieved in most fisheries varying from 71% to 99% Namibian ownership. Figure 2 above depicts that about 87% of the industry share is presently in the hands of Namibians implying a success in the Namibianisation policy. The Namibian ownership share in the Hake fishery is 88%, while Small Pelagic and Horse mackerel are 85% and 74% respectively. The government’s drive for the industry to be controlled by Namibians had succeeded. Success is also recorded in employment Namibians in vessels, which stood at 68% of the total fleet by 2003 an increase of 5% from 1999. However, more still need to be done to ensure that the targets set are met especially in the mid-water sector, which is still dominated by non-Namibians representing an average of 56% Namibian ownership for the 5 years in question. As stipulated in Namibia’s Vision 2030, it is expected the Namibian presentation is the midwater sector and entire fishery sector will improve.

GDP contribution

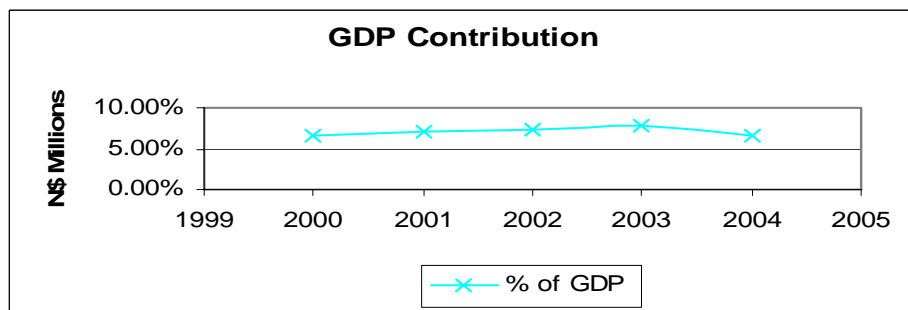


Fig 2: Fisheries contribution to GDP, (2000-2004) (N\$ million)
 Source: Ministry of Fisheries and Marine Resources (2004 Annual Report)

The total fisheries contribution to Gross Domestic Product (GDP) has increased considerably since independence ranging from 6.5% in 2004 to 7.8% in 2003. The slight fall in 2004 is due to contractions in the catches especially in the hake fishery. In addition, raising oil prices had also negatively affected the industry. Despite volatile environmental conditions, fishing in general has in general managed to record increased contribution to the economy over the years. Fishing is rated the second highest contributor to Namibia's GDP after mining. Fish GDP contribution is divided into two main forms, fishing and fish processing. Fishing relates to the value of fish in the form it is landed and processing refers to the value of fish after processing or value addition. The increase in fishing is a result of increased stock availability while improved processing contribution results from value addition. Value Addition is encouraged by government effort to persuade value addition to fisheries products as opposed to exports of raw materials. These developments emphasise the management success in ensuring the stock is conserved to yield notable contribution to the national economy. In addition, the industry is still generating a vital economic rent, which most countries have so far failed to produce. The Namibian fishing industry's revenue is mainly generated from fish exports, with about 90% of fish and fish products being exported to EU countries.

Exports

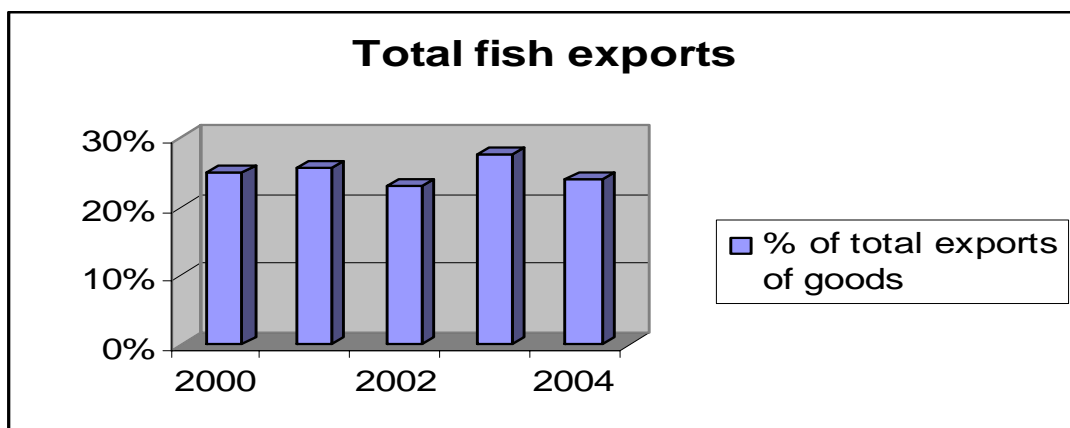


Figure 3: Total Fish and Fish Products Export Values (2000-2004)

Source: MFMR: Economic Data base

The majority of Namibia's fish resources are mostly destined for export markets. About 90% of the fish is exported leaving about 10% for local consumption. Hake goes to European countries such as Spain, Portugal, Germany and Italy; Horse mackerel is exported to West African countries, Southern African Development Communities (SADC) countries especially Democratic Republic of the Congo and South Africa, while Pilchards is mainly exported to the United Kingdom (UK) and South Africa. The total fisheries export has increased since 1998 therefore making Namibia's fishery sector the second highest export-earning sector after mining. The value of Namibia's total exports has considerably increased by about 35% from 1998 to 2003. The reasons for the increase are firstly, because of the proper fisheries management regime in place, which led to successful rebuilding of stock; secondly, the fishing operations have been profitable mainly due to efficiency in boats and management; thirdly, the prices of fish and fish products have been increasing quite considerably especially in Europe where most stocks have been depleted.

Monitoring control and surveillance

Illegal unreported and unregulated fishing has been avoided since the introduction of the right management system. To avoid further plundering of Namibia's fisheries resources and the problems of illegal, unreported and unregulated fishing Namibia has prioritised its monitoring control and surveillance programme. Investment in surveillance activities demonstrates the importance the policy makers attached to curbing illegal fishing and ensuring the stock is sustained for the future. The EU sponsored MCS-SADC programme had assisted in conducting joint fisheries surveillance operations in Namibia, Angola and South Africa as well improving the fisheries legislation among fisheries observers, inspectors and the fishing industry. Monitoring control and Surveillance is undertaken both at sea, onshore by patrol vessels, patrol aircraft and coastal vehicles patrols as well as by observers.

The programme facilitated the acquisition of three patrol vessels. One fixed wing aircraft "Sea Eagle" does the air surveillance, which undertake between four and five missions per week. A further enforcement measure is done by the Fishery Observer Agency, which ensure that each vessel deployed has an observer on board. The fishing industry is responsible for the costs of the onboard observers including their salaries.

Land and coastal patrol entails the monitoring offloading and transshipments of fish at factories, ports and the coast as well as illegal angling along the coast. In addition it assists the recording of landings information to help management in stock. The data that may prove valuable to scientists because they contain fish length, age or maturity.

Although Namibia is comprised of large-scale fishing operations as opposed to artisanal fisheries where difficulty in enforcement is eminent, incidents of violations are occasionally experienced.

Namibia has with the assistance of the EU-SADC MCS sponsorship, introduced the national satellite based Vessel Monitoring System (VMS) which will supplement the monitoring control and surveillance (Namibia Marine Resource Policy, 2004). The system is meant to assist fisheries management by tracking fishing vessels movements in turn curbing down on illegal unreported and unregulated fishing in the Namibian waters.

CONCENTRATION AND MARKET SHARE

Industrial concentration is explained Mansfield (1964), Sloman (2003) and Griffiths & Wall (2004) as the number and size distribution of firms in an industry or economy. In general, the most concentrated industries are either those that have intensive levels of advertising, research or both. Advertising is a method of convincing customers to a particular good for reasons other than prices. High advertising and research create competitive advantage and allows a small number of firms to dominate the sector. In the fishery sector however, advertising may not be as crucial to acquiring dominion as in other sectors of the economy. Though the fishing firm may have a large customer base, its profitability may largely be dependent on the quota allocated. However, research and development is crucial in fisheries since the discovery of new fisheries or new fishing grounds results in increased fishing activities. As Hay and Vickers (1987) suggest, other factors such as being granted powers by public authorities, mergers and predatory behaviours of bigger firms towards small firms are just some of the factors that influence market dominion.

The competitiveness of the market can be determined by observing the number of firms in the entire economy or within a specific sector of the economy. The more the firms, the more competitive the market may be deemed to be. However, the number of firms may not reflect on the extent of market concentration. Despite the existence of many firms, the large portion of that sector of the economy may be in the hands of very few companies, which in turn may constitute an effective oligopoly. Griffiths (2004) points out that the most usual method of measuring the degree of oligopoly in the sector is by the concentration ratio. It reveals the proportion of the industry's output accounted for by each firm. An example 80% of the twenty-industry's output can be held by only 5 firms while 15 share the remaining 20%. The increase in the ratio indicates an increase in concentration of the industry.

The major concern is that ITQs may result in concentration of the fishing industry's quota into the hands of few individuals. By reducing overcapitalisation there is a need to reduce vessel members, which entails eliminating the inefficient vessels that are more likely to be small fishers. The remaining boats are mainly those that are efficient and usually bigger and well established. In fisheries, concentration is defined as the domination of ports, fleets and the entire industry by an unacceptably small number of firms who may use their power to the disadvantage of the communities. The introduction of right-based management system had provoked disputes and lawsuits especially concerning its distributional consequences to local communities in countries such as Iceland etc, mainly because of the system's failure to promote fairness and equity especially keeping small operators in the fishery. The failure to redistribute rights accordingly results in lost opportunities and wealth, which in turn may result in poor economic performance of the fishery.

Managing of rights and quota may become so demanding that a company success in acquiring the right quota mix become more important determinant of its success than the efficiency of its fishing operation. If these effects become greater and reduce competition, there can be economic losses. It was however felt that competition in the industry was necessary. Oelofsen 1999 and Arnason 2002 clearly underlined that the quota system in Namibia is non-transferable, hence it is expected that there would be no concentration. In addition, quota transferability conflicts with the policy of Namibianisation, which is meant to empower the formerly disadvantaged groups.

However, Hatcher et al (2002) has illustrated how fixing the quota (quota non-transferability) may impose the constraint on the efficiency of the fishing vessel for the duration of the quota. This would then give an operator incentive to exceed the allocated quota thus in turn making fisheries management difficult especially when proper enforcement is not in place.

How bad/good is concentration?

Under perfect competition each firm combines its resources to produce output that is socially desirable because the competitive prices correctly reflect relative demand. However, under oligopoly these conditions are unlikely to be fulfilled. The oligopolies sell at prices higher than the marginal cost of production therefore becoming unreliable indicators of the demand.

The reduction in the number of right holders in the industry has two main effects to the sector and the economy at large. Firstly, the quota in the hands of a few people results in direct job losses to smaller local fishermen and possibly to the secondary other industry dependent on the supply by those local fishers. Large operator's products are usually geared for export markets therefore reduced supply to local markets may be the result, thus resulting in shortage of fish food supply.

Secondly, concentration results in increased efficiency of the remaining right holders and thus resulting to the profitability of the industry. The remaining right holders will experience increased catch per unit of effort with results in improved incomes for the remaining employees in the sector. In addition increased incomes and profits leads to increased consumption thus motivating investment in the sector.

MEASURING CONCENTRATION

Individual transferable quota is argued to promote unfairness in participation either at the beginning of rights-based management system (initial allocation) or in the process of management due transferability. Since the Namibian fishery management system does not permit permanent quota transferability, by how much has it managed to avoid concentration of the industry into the hands of few?

The most commonly used measures of concentration are the Herfindahl Hirschman Index (HHI) and the Four Firm Concentration Ratio. Measuring concentration requires the number of firms and the market share for the industry for the period in question. Due to a large number of small (newcomers) companies which depended more on bigger companies to catch their quotas, the sales was difficult to split by right holders. The fish sales figures in Namibia which could be used to measure market share were until recently recorded only as a lump sum for the whole fishery e.g. hake, thus making it difficult to split by right holder. Instead, in this analysis quota allocated was used to measure market share assuming that all allocated quota is caught and sold. The other measure of concentration that could be potentially used is the Gini coefficient (Liew, 2000), which like HHI is used to measure the income inequalities. For the purpose of this study, the market is defined as the fishing industry. The measure for market share is to determine the number fishing firms in the industry and their relative share of the allocations.

Calculating of Herfindahl Hirschman Index, the formula used is as indicated below

$$\sum_{i=1}^n S_i^2 = S_1^2 + S_2^2 + \dots + S_n^2$$

where S_i is the market share (in this case, quota share) of firm i .

The number of firms in the industry and their relative market share has an influence to the HHI. The closer the market to being a monopoly, the higher the market concentration and it is likely that the lower would be the competition. If the industry is comprised of a single firm the market share would be 100% and thus the HHI reflects an amount of $(100^2) = 10\,000$ indicating monopoly. Similarly the firm's share can be measure in ranges between 0 and 1, where 0 indicates no concentration and 1 indicate a highly concentrated industry. In a nutshell, the smaller HHI value signifies a high number of firms in the market therefore indicating perfect competition.

Tables 6, 7 and 8 presents the quota allocation for three most important fisheries in the Namibian fishing sector i.e. Hake, Horse Mackerel and Pilchard dating back from 1998 to 2003. The quota allocations are arranged for every right holder and the percentage quota allocation to each right holder for that particular year is indicated. For the purpose of confidentiality, the companies' names are concealed and rather indicated by numbers.

The number of right holders has changed since 1998 with particular reference to hake, which reduced from over 45 right holders to 38 from 2001 to present. Some right holder's rights had expired and were not renewed resulting in their departure from the industry, whereas some have formed joint ventures with others operators. Depending on the method of quota allocation, a reduction in the number of firms may result in the surplus quota causing concentration in the fishery by allocating the excess quota to only a few firms.

RESULTS

The allocation in Namibia is done on a *pro rata* basis- based on previous year's allocations. In addition, offshore & onshore investments and socio-economic contribution also plays a role in determining the amount of quota allocation for the right holders. The percentage allocation within each fishery for all the years has been roughly similar throughout the years. The observed changes in actual amounts of quota allocated are observed mainly due to changes in the amount of Total Allowable Catches, which is in turn dependent on the Benguela ecosystem (environmental conditions at sea). Despite reductions in quota holders in some fisheries empirical analysis yields significant results to conclude that that by observing there is no concentration in the Namibian fishery. The hake fishery shows a HHI between a mere 0.05 and 0.06, as indicated in table 6(b) therefore indicating that no concentration exists in the hake fishery. The horse mackerel fishery has a HHI between 0.13 and 0.14 as shown in table 7(b) and Pilchards' lies between 0.05 and 0.08. The inexistence of concentration is reflective of the advantages of non-transferable quota system over ITQ and possibly suggests a better fisheries management approach.

However, different results may be achieved if the effective ownership of firms in other fishing firms within the fishery is determined. For instance, if firm A owns (shares in) firm B and they all have hake rights, the share of quota allocated to firm A in that fishery would be high. The relatively high amount of quota as a percentage of TAC would then result in firm A exercising dominion over that fisheries pricing. The Namibia government initiative to encourage joint ventures among fishing companies has resulted in acquisition of shares mainly in smaller right holders by bigger companies. The policy seems to overlooks the multiple-ownership of firms by not restricting the share ownership an individual firm can own in other firms within a fishery. The government concern is more of Namibian ownership of the fishery than the levels of concentration. While the joint-venture system may assist small and financially struggling firms (right holders), the direct involvement of the smaller operators may be affected. However, the detail of the impact of joint ventures on concentration is beyond the focus of this paper.

CONCLUSIONS

The Namibian quota management system has recorded a number of positives as this study observed. The effort control mechanism has worked quite well in favour of both stock conservation and economic viability of the industry. The future of fisheries depends on how effective the management system put in place by current fisheries managers.

The study reveals that right-based management and specifically individual quota system and specifically non-transferable quota is a correct method to manage the Namibian fisheries stocks. Quota non-transferability ensures that there is no concentration in the fisheries while efficiency is still maintained. The system has succeeded in achieving most if not all policy objectives as set in the policy document. Perhaps the main success is the recovery of stocks that were nearly depleted before the implementation of the management system. The increased landings and other scientific evidence have indicated improvement in most stocks over the years although in some cases the increase is quite low.

The profitability of the industry is reflected in its ability to create enormous investments in vessels and onshore processing facilities as well the creation of jobs for Namibians. Despite the non-transferability of the quota, which is meant to ensure efficiency, the industry is still economically efficient in its fishing operations. The number of Namibians involved in fishing activities shows a considerable increase since independence, which entails the success of the Namibianisation policy (87%) and empowerment of Namibians. In addition the Namibian management system has demonstrated success in dealing with concentration of the quota/right into the hands of few group of individual by ensuring rights non-transferability.

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¹Individual Transferable Quota (ITQ) allows fishermen to hold a share from the mostly biologically determined Total Allowable Catch (TAC).

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