THE DYNAMICS OF RECREATIONAL ANGLING IN NAMIBIA

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ABSTRACT

In Namibia, the linefish sector is in principle exploited by two sectors: recreational anglers and commercial rightholders. Recreational angling, in the broad Namibian context, is made up of two categories of fishing activities; that which is exerted for the purpose of pleasure or as a sporting activity (recreational anglers), and that which is exerted in order to sustain food supply (subsistence anglers). The annual recreational survey is conducted with the aim of determining the extent of recreational angling, which mainly includes obtaining data on the amount of effort applied to the resource and the subsequent level of catches, and the economic and financial factors, including government revenue, collected through this industry. Furthermore, the collection of data was based on the travel cost method. The commercial line fish operators are not subject to a quota system but they are restricted in terms of the number of boats that may be licensed, and the recreational anglers are subject to daily bag limits, while both sectors are subject to closed areas.

During comparison of the 2003 and 2001 survey results, however, it also became clear that there was no significant variation in the results, which made it easier to estimate average indicators such as fishing days and fish caught per day. Furthermore, while one bears in mind that December is usually a peak season with the highest record of permits issued during that time, one cannot ignore the catch capabilities of these fishermen and the potential effects on a resource that is also commercially exploited. Survey results for 2003 indicate that anglers catch approximately between four and five fish per day resulting in an estimated 534,336 fish and 402,720 fish caught by 50,556 and 43,981 shore anglers in 2003 and 2002 respectively. In addition, direct angler expenditure was estimated to may have amounted to N$ 380.8 million in 2003.

Keywords: recreational; catch; effort; economics; travel cost method

INTRODUCTION

Aims and Objective of conducting the survey

The angling sector in Namibia currently consists mainly out of the commercial Linefish boat and ski-boat fishermen and recreational skiboat and rock and surf anglers. Recreational anglers in turn are broadly sub-divided between those anglers who partake in fishing for the purposes of enjoyment or sports, and those anglers who undertake angling in order to sustain or complement their food supply. Rock and surf angling is done by means of a rod and a reel from the shore and this type of angling is estimated to have the highest socio-economical value of the Linefish angling sector (Holtzhauzen et al, 1998), and these angling activities attracts thousands of angling tourists every year. The Namibian marine fishery is a dynamic sector, constantly changing and requires the Ministry of Fisheries and Marine Resources to react and adjust its operations accordingly while ensuring optimal utilization of marine resources. The complex nature of this sector and variety of participants, within in the Linefish sector, who all claim a part of the angling stock makes this fishery sector a challenging one to manage. The aim of the survey is therefore, to determine the extent of recreational angling, which includes the amount of people harvesting the resource, the method of angling and estimated amount of fish they are taking annually, and includes the collection of data on nationality of anglers and trip expenditure. Furthermore, the survey also finally aims to estimate the economic value of the recreational angling sector. This information is collected with the ultimate objective to assist management with decision-making in terms of the management of this resource.
OVERVIEW OF THE LINEFISH INDUSTRY

The most popular angling fish species include kob (*Argyrosomus inodorus*), also known as kabeljou, West Coast steenbras (*Lithognathus auretii*), and snoek (*Thysites atun*) and they form part of the multi-species catch of both the commercial linefish and recreational rock- and surf-angling sectors. The commercial Linefish boats and skiboats are not subject to a quota fee system and may catch as many linefish species per year as they are able to, while recreational anglers are subjected to the daily bag limits in terms of the regulations and they are not allowed to sell their catches. The commercial Linefish sector are however restricted in terms of the number of boats that can be licensed for each season, and the recreational anglers are further subjected to size limits. Catches of commercial Linefish boats and ski-boats are recorded in logbooks on a daily basis, but the catches from recreational skiboats and rock – and surf – anglers have to be estimated through interviews and by measuring their catches (Holtzhauzen et al, 1998). Currently the commercial Linefish sector consists of 12 rightholders, while there are no limitations on the number of recreational anglers per season.

There have been a perception that there is an apparent decline in CPUE of Linefish along the Namibian coast, which is the cause of conflict between commercial and recreational anglers who blame each other, with commercial anglers feeling that recreational anglers threaten their livelihood, while recreational anglers feel that commercial anglers are to blame for the decline in the stock (Kirchner et al, 2000). The target reference level of depletion for both the silver kob and the west coast steenbras stock was set at 50%. The biomass for silver kob is estimated to be about ± 7500 tonnes, while the size of the stock is currently in the region of 40% of its original (before exploitation) state. The spawning (adult) stock biomass of West Coast steenbras is small and estimated to be in the region of 2000 tonnes. The stock size is about 53% of its pristine (before exploitation) state (MFMR, 2003).

METHODOLOGY

The survey was a random sample of recreational anglers, partaking in fishing activities along the Namibian coastal areas between Terrace Bay and Meob Bay. In order to be representative and efficient, the sample size represented in the document amounted to 465 anglers allowing for a margin of +/- 4%, and a confidence level of 95%.

Two sets of questionnaires were used during the survey. One questionnaire was aimed at recreational anglers and the second was aimed at subsistence anglers. One of the limitations to the survey was the absence of a clearly defined distinction between subsistence and recreational anglers and every attempt was made to correctly classify the anglers in the category that they belong. It became clear however that the proportion of subsistence anglers interviewed were very small as the majority of interviewees were recreational anglers. Subsistence anglers usually reside in the coastal towns, walked to the beach and generally had little money to spend on modern and expensive angling equipment or bait (Kirchner et al, 2000) and therefore the contribution from the subsistence sector was determined to be negligible. The first survey of this nature was conducted in 2001, and prior to conducting the 2003 survey, it was deemed necessary to review the format of the survey document and some changes was made to the original document. These changes, in essence made it difficult to compare it directly to some of the results obtained and analysed during the 2001 survey but it was possible to compare certain indicators such as average angler days, fish caught per day and expenditure per angler. Furthermore, due to the fact that the issue of permits was only implemented in December 2001, the study had to make use of the data for 2002 and 2003 in order to obtain the actual number of anglers for each season and thus our analysis focused on these two periods.

All interviews were carried out under the authority of the Ministry of Fisheries and Marine Resources and all interviewers were employees of the Ministry and carried the Ministry’s Identification cards. The major component of these efforts was focused to on – site interviews of anglers.

In addition to the shore anglers who were willing to be interviewed, further sources of data include the Ministry of Fisheries and Marine Resources, while literature references were also made to an overview of the kob fishery by Holtzhauzen et al (1998), and a separate study on the economic evaluation of the recreational angling sector conducted by Kirchner et al (2002). The aim of this paper was also to provide an economic evaluation of the recreational sector, however, we must state that our methods differed from that used by Kirchner et al (2002), since these were two separate surveys.
RESULTS

Profile of Anglers

The survey aimed to get an overview of the demographic profile of anglers by looking at the nationality, gender and age structure of anglers. In addition, the employment and income status of these anglers will also be illustrated in order to have an understanding of the economic status of anglers.

The overwhelming majority of recreational anglers consist of males, which made up 84% of all respondents, while female anglers made up 16% of total anglers interviewed. In addition, the majority of anglers, amounting to 41%, fell in the age group between 31 and 50 years in 2003, while anglers who fell in this age group made up 52% of all respondents in 2001. In addition, 36% of anglers were employed, 26% of anglers were self-employed, while 17% and 11% of respondents reported to be students and retired respectively. The majority of anglers interviewed (37%), reported earnings of less than N$ 2000.00 per month, which may be contributed to the fact that 17% of respondents reported to be students while 11% of respondents are retired. On the other hand 21% of interviewees reported monthly incomes in excess of N$ 11 000.00 per month.

The majority of anglers consisting of 83% (2003) and 87% (2002), prefer beach angling, while 13% and 11% of the sample anglers interviewed in 2003 and 2001 respectively, indicated that they also do rock angling. A very small percentage of anglers, amounting to 4% and 2% of the respondents in 2003 and 2001 respectively, indicated that they also undertook ski-boat fishing.

Catch and Effort

The effort exerted on the linefish resource by the recreational anglers is considerable, given the fact that this is a fishery also exploited by the commercial Linefish industry. The majority of the participants in the 2003 survey (33%) indicated that an angling trip runs for approximately 7 days, while 26% of the anglers interviewed indicated that an angling trip consist approximately of 14 days. The main species targeted by the recreational anglers are Silver Kob (Kabeljou) (33%), West Coast Steenbras (27%) and Galjoen (25%).

As can be seen from Graph 1 and 2, the number of anglers increased by approximately 15% from 43 981 anglers in 2002 to 50 556 anglers in 2003, while the distribution of anglers followed the same trend in both years, indicating peak periods in March and December. Non-Namibian anglers increased by 30% in 2003 compared to 2002, while Namibian anglers increased by 9% in 2003 compared to 2002. A survey conducted by the Ministry of Environment and Tourism revealed that next to Windhoek, the Namibian coast, specifically Swakopmund and Walvisbay are, respectively, the second and third most popular locations (MET, 2002) for tourists (see Annexure 1 for map of Namibia). In addition to political stability and good infrastructure, Namibia is also renowned for its beautiful landscapes and tourists are reported to have cited this, in addition to the fact that one third have visited Namibia before, as the main reasons that they visit Namibia (MET, 2002).

Based on the computed results, the majority of anglers, 44% and 47% in 2003 and 2001 respectively, reported to be catching on average between four and five fish per day. As a result of the similar results obtained from these two surveys, this estimate was considered as a reliable indicator of angling activity and was thus used to compute the mean number of fish caught.
The estimated number of angler days increased from 307,867 angler days in 2002 to 353,892 angler days in 2003, as seen in Table 1. The total number of angler days per year was estimated by multiplying the daily mean number of anglers by the mean number of days spent fishing per trip for each season.

Table 1: Estimated values of angler days for 2003 and 2002, (numbers)

<table>
<thead>
<tr>
<th></th>
<th>2003</th>
<th>2002</th>
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</thead>
<tbody>
<tr>
<td>Mean number of Anglers per day</td>
<td>138</td>
<td>120</td>
</tr>
<tr>
<td>Standard Deviation</td>
<td>90</td>
<td>96</td>
</tr>
<tr>
<td>Mean number of Anglers per month</td>
<td>4213</td>
<td>3665</td>
</tr>
<tr>
<td>Standard Deviation</td>
<td>2798</td>
<td>3000</td>
</tr>
<tr>
<td>Estimated total number of Angler Days per annum</td>
<td>353,892</td>
<td>307,867</td>
</tr>
</tbody>
</table>

Based on the estimated mean number of anglers per day and a mean catch of between four and five fish per day, an estimated number of 534,336 fish could have been caught by recreational anglers in 2003, compared to an estimated number of 402,720 fish in 2002. The estimated number of fish caught, is computed by multiplying the mean number of anglers per day by the mean number of fish caught per day. The Ministry of Fisheries and Marine Resources, however, estimated that the total catch for the recreational fishery amounted to approximately 245 tonnes in 2002.

Expenditure on Angling/ Willingness to Pay

One way of determining the economic value of the recreational Linefish fishery is to determine the value in use (this is the total amount that the angler is willing to pay for the activity. It consists not only of the anglers’ actual expenditure but also the ‘consumer surplus’ which is the difference between what the angler is willing to pay and what is actually paid) (Kirchner et al, 2000). All monetary values was estimated in Namibian Dollars (N$) and the exchange rate prevalent at the time of the survey, December 2003 was as follows: N$1.00 =ZAR 1.00=US$ 0.1532. Results from the survey indicated, as expected, a higher total average cost for South Africans compared to Namibians as can be seen from Table 2. Based on our estimations of the average cost per angler and the number of anglers (50,556) that engaged in recreational fishing during the 2003 fishing season, the total expenditure that could have been incurred by anglers is estimated to have amounted to approximately N$ 452.6 million. Direct expenditure that may have been incurred by shore anglers within the Namibian borders is estimated to have amounted to approximately N$ 380.8 million in 2003.

Table 2: Expenditure by Recreational Anglers per angler, 2003 (Standard Deviation)

<table>
<thead>
<tr>
<th></th>
<th>Namibians</th>
<th>South Africans</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean Travel Cost</td>
<td>1,980</td>
<td>2,924</td>
</tr>
<tr>
<td>Mean Accommodation Cost</td>
<td>2,300</td>
<td>3,014</td>
</tr>
<tr>
<td>Mean Entertainment Cost</td>
<td>1,450</td>
<td>2,284</td>
</tr>
<tr>
<td>Mean Cost of Fishing*</td>
<td>2,184</td>
<td>4,375</td>
</tr>
<tr>
<td>Total Cost of an angling trip</td>
<td>7,914</td>
<td>12,597</td>
</tr>
<tr>
<td>Average Cost per fish</td>
<td>256</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>Value per Angler</th>
<th>Aggregate Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Direct angler expenditure¹</td>
<td>7,768</td>
<td>N$ 380.8 million</td>
</tr>
<tr>
<td>Consumer surplus²</td>
<td>2,253</td>
<td>N$ 110.4 million</td>
</tr>
<tr>
<td>Value in use/Willingness to pay³</td>
<td>10,021</td>
<td>N$ 491.3 million</td>
</tr>
</tbody>
</table>

* The costs associated with fishing equipment and bait.

¹ Direct expenditure within Namibia.
² Indirect estimation = Direct Expenditure * 0.29 (Kirchner et al, 2000)
³ Sum of consumer surplus and direct expenditure
The aggregate consumer surplus for the recreational angling sector in 2003 is estimated to have amounted to approximately N$ 110.4 million, as indicated in Table 2. The estimated consumer surplus excludes some elements of expenditure by non-Namibians, such as travel cost, as it is difficult to differentiate between what was spent within the borders of Namibia and that spent outside of it, and also some cost elements in the cost of fishing such as rods, tackles and reels was also excluded, as it is assumed that these expenditures have been incurred before the trip was undertaken. The consumer surplus refers to an economic benefit that accrues only to Namibians (Kirchner et al., 2000). The consumer surplus was not estimated directly by this study but was calculated by using the indicator applied in the study by Kirchner et al (2000) where they assumed that the consumer surplus of anglers was 29% of their expenditures.

An estimated number of 534,336 of fish was harvested in 2003 and based on estimated expenditure in 2003, the average cost per fish, amounted to N$ 256. Based on a survey conducted by Kirchner et al (2000) in 1996/7, it was estimated that 8,800 shore anglers spent a total of N $ 29.7 million in 1996/7 while the cost per fish amounted to N$ 95.

Government Revenue

Recreational anglers are required to purchase a permit in order to take part in angling, and these permits are either monthly, at a fee of N$14, or annual, at a fee of N$168. The commercial Linefish operators in turn are required to pay a vessel license fee, as well as a fund levy of N$25 per ton of fish caught. As can be seen from Graph 3 below, government revenue from the recreational angling sector is significantly higher, and amounted to N$ 900 438 in 2003, than that collected from the commercial Linefish operators indicated in Graph 4, which amounted to an estimated N$42 796 in 2003. As can clearly be seen, the opportunity cost attached to the recreational angling sector is significantly higher than for the commercial sector in terms of the revenue that would be foregone if the recreational angling sector should be closed.
Furthermore, following a comparison between the government revenue collected from the commercial Linefish operators and the value of the catch, it is clear that the government revenue collected by this sector makes up less than 1% of the final value of the catch, which amounted to an estimated N$13.3 million in 2003.

5. CONCLUSIONS

The number of recreational anglers has increased considerably from approximately 8,800 in 1996/7 (Kirchner et al, 2000) to 50,556 in 2003. It is clear that this increase in the number of recreational anglers has resulted in increased pressure on the Linefish stocks, which is simultaneously exploited by the commercial Linefish operators. As can be seen, the contribution of the recreational anglers to the economy may have amounted to an estimated N$380.8 million in 2003, compared to an estimated N$13.3 million contribution to the economy by the commercial Linefish operators in 2003. The recreational angling sector contributes significantly to the Namibian economy, not only in terms of direct expenditure but also indirectly in terms of spin-offs to various sub-sectors and it can further be argued that the recreational angling contributes significantly to sustaining employment, especially coastal economies that are highly dependent on tourism. It may be argued that the recreational angling sector contributes more significantly to the Namibian economy overall, and should therefore enjoy preference over the commercial linefish industry with regard to access to the resource. However, it must also be acknowledged that the commercial Linefish operators have made investments in the fishery of approximately N$6.2 million in Linefish boats, fishing gear and processing facilities, while also contributing directly to employment creation. The commercial linefish sector is estimated to have employed approximately 236 people in 2003 of which 80% were Namibian.

Both sectors contribute significantly to the exploitation of the resource, it is however worth noting that the current management and conservation measures such as the bag limits, size limits, restrictions on the number of commercial boats and closed areas have played a major role in sustaining a resource that have simultaneously been exploited by two principal sectors. In addition, the Ministry of Fisheries and Marine Resources has recently terminated the commercial linefish rights of 9 rightholders who did not meet the criteria for the extension of a right and it is not likely that these rights will be renewed or replaced in the foreseeable future. Alternative options are continuously explored in order to improve the sustainable management of this resource.

While it appears that more measures could be introduced to aid the conservation of the Linefish stock, the economic and social importance of both sectors should also be taken into consideration. The termination of commercial harvesting rights may not be an option due to the investments made and employment created by the commercial Linefish sector, while closing the Linefish fishery to recreational anglers would have significant economic implications to especially the coastal communities. It is clear however that a decision in favor of the commercial rightholders would result in considerable loss of revenue to the government while the opportunity cost of deciding in favor of the recreational anglers would be negligible in terms of the revenue foregone by the commercial sector.

REFERENCES

Annex 1: Map of Namibia and neighboring countries

Source: Ministry of Fisheries and Marine Resources