

INTEGRATED CO-MANAGEMENT OF ZAMBEZI / CHOBE RIVER FISHERIES RESOURCES PROJECT

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Fishing activities in the Zambezi/Chobe region: Report on 2008 fishery frame survey

February 2011



Meeting with induna and fishers in a fishing camp



Typical fishing camp on the Zambian side of the river



Distribution of fishers in camps and villages



Fishing craft at beach on Lake Liambezi

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Technical Report no. MFMR/NNF/WWF/Phase II/3



FISHING ACTIVITIES IN THE ZAMBEZI/CHOBE REGION

Report based on a fishery frame survey in 2008

REPORT TO

MINISTRY OF FISHERIES AND MARINE RESOURCES, NAMIBIA

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Integrated Management of the Zambezi/ Chobe River System Fishery Resource Project

A joint project between the Ministry of Fisheries and Marine Resources, World Wildlife Fund (WWF) and Namibia Nature Foundation (NNF)

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Plate 1 Meeting with induna and fishers of a fishing camp on the Zambian side of the Zambezi before fishers are questioned individually during the frame survey 2008.

Summary

This frame survey was conducted by the Ministry of Fisheries and Marine Resources of Namibia with support from the Integrated Management of the Zambezi/Chobe River System Fishery Resource Project and attempted to cover all accessible villages and fishing camps on the floodplain in Botswana, Namibia and Zambia.

575 villages and fishing camps were visited in Namibia and Zambia, where an estimated 5 754 fishers lived in a population of 32 200 people.

The fishers formed 17.8% of the total village population in general but the number of fishers per village or fishing camp was 5.7 in Namibia compared to a much higher 33.7 in Zambia.

Villages and fishing camps are both mainly old and established, with an average age of 64 years.

Crops are planted at almost all villages, dominated by maize, but also vegetables and other crops. More crops are planted in the higher dry uplands in Zambia than in Namibia where most villages lie in the floodplain itself.

A total of 1473 fishers were questioned from the 575 villages and fishing camps visited.

Only 2.5% of fishers were female and then mostly young women up to 40 years.

23.7% of the fishers in Namibia were Zambian citizens but in Zambia only 4.1% were Namibians.

The Zambians speak mostly Silozi but in Namibia about half of the fishers use Sisubia as home language. Very little other home languages were recorded.

81% of fishers are self-employed but 20% of Zambian fishers in Namibia are hired locally. The percentage self-employment increases with age of the fishers and more fishers in Zambia are self-employed than in Namibia.

On both sides of the Zambezi more than 85% of fishers are heads of households. The number of dependants climbs from a low in young fishers to a peak at more than six dependants on both sides of the river and the actual number of dependants seems to be higher in Zambia, indicating the importance of fishers as breadwinners.

Fishing is a lifelong profession with some fishers having fished for 60 years. However, a large number of fishers have entered the profession over the last five years. In Zambia this happened about five years ago and in Caprivi recently, one year, reflecting attractiveness of fishing as occupation after three good flood years and good prices.

Wooden canoes or *mikolo* [sing.*mukolo*] are used by 99% of the fishers. Only 0.26 % engine powered boats were recorded.

The average number of gill nets owned by Zambian fishers is 5.6, considerably higher than the average of 3.8 in Namibia. Some fishers indicated owning up to 200 nets. Although data on mesh sizes were collected during the survey, it is not available yet and should become available with future frame surveys.

There is a steep increase in the number of nets used over the last 6 years reflecting a recent increase in fishing pressure.

A low number of dragnets were recorded and the time they have been used is only a few years. Bashing however appears to be an old practice and was recorded more frequently up to 43 years ago.

Only 16% of Namibian and 30% of Zambian fishers possessed valid fishing licenses, reflecting the situation on the ground. Reasons offered for not possessing fishing licenses included unwillingness, difficulty to obtain licenses and low level of law enforcement. Owners of nets had a slightly higher possession of fishing licenses than non-owners in Namibia but the opposite was found in Zambia.

Nearly 60% of the fishers fish fulltime, 30% part-time and the rest seasonal or occasional.

Fishing is also the main source of income for more than 70% of the fishers but again more than 50% practice fishing and farming together with just less than 10% doing business as well.

Of the alternative sources of income, generally, crops scored 36%, cattle 9% and pension 5%. But in Zambia income from pension scored only a low 0.4%.

Nearly 80% of the fishers indicated they don't require any permission to fish. Where this was required, the local induna was the most important, with government or khuta scoring very low. More often permission was required to fish milapo and channels than the open river, floodplain or backwaters which can then be regarded as truly open access fishing grounds.

Fishers preferred the main channel, followed by channels and milapo to set gillnets. They were willing to share fishing grounds with especially family and neighbours, with lowest scores for lodges.

Only 30% of the fishers regard the fishing in 2008 as good, this in spite of the recent good floods and fishing years. The trend for optimism dropped also from young to older fishers in Namibia but less so in Zambia.

Best and worst times to fish were not very clear but most fishers indicated that winter is best and spring worst to fish.

In general, fishers accept that regulation and control of the fishery is needed with around 90% in favour of regulation in both Namibia and Zambia.

The government [Fishery Departments] was indicated as the most important institution to control fisheries, followed by traditional authorities. No difference between the perception of full-time and other fishers was evident and conservancies as regulators scored very low, possibly as the concept is new and fishers have no experience of the benefits or operation of conservancies. In Zambia there was a higher support for government control and in Namibia traditional authorities scored higher.

The perceived benefit of controlling the fishery was also asked and most fishers offered the conservation of fish life and protection of fish breeding as reasons, with a smaller support for the prevention of entry by outsiders.

Methods proposed to achieve the protection of the fish resources were listed in priority from closed season, followed by banning small mesh nets and dragnetting. Fish reserves and also fishing licenses scored much lower.

In Zambia there was more support for closed seasons and in Namibia dragnetting scored higher than in Zambia.

Fishers are generally prepared to pay for fishing licenses but many have no cash. The support for contribution was between 70 to 85% amongst citizens in Namibia and Zambia with Zambians showing slightly more support.

On the opinion on how the generated funds should be spent, the government, people in the community and fish guards scored highest in Namibia and Zambia. Conservancy development or support of the local induna or traditional authority was supported by fewer fishers.

In Namibia just below 60% of the fishers indicated they knew Epizootic Ulcerative Syndrome fish disease. In Zambia this value was closer to 80% indicating a better awareness, possibly the effect of better media coverage in Zambia

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Abbreviations

EUS – Epizootic Ulcerative Syndrome

MFMR - Ministry of Fisheries and Marine Resources

cpue – catch per unit effort

ZCFP - Integrated Management of the Zambezi/ Chobe River System Fishery Resource Project



Plate 2 Typical fishing camp on the Zambian side of the river during low water. This camp will be flooded later and has to be rebuilt next year.

1 BACKGROUND AND MOTIVATION

Fishing is one of the most important socio-economic activities in the Zambezi/Chobe River and associated floodplains that form the basis of the livelihood of more than 30 000 people living on the floodplain. A limited frame survey of fishing was undertaken on part of the floodplain in 2002 (Abbott et al 2003).

Concerns have been raised about recent signs of overfishing in the region with particularly larger fish becoming scarce, recreational anglers making meager catches, a considerable increase in gillnetting using small mesh gillnets, illegal fishing activities and conflicts in the Zambian border area.

Biological surveys with a standardised set of gillnets over the last 11 years support this observed and reported trend and this fact has been reported by this Project as basis for the consideration of specially protected fish reserves and more relevant fishing regulations (Hay and van der Waal 2009). The collected biological data is presently further analysed for future reference as the MFMR does not have a complete earlier assessment of the fishing effort and catches. A frame survey of fishermen and their gear was undertaken by the previous Project in 2002. Since then, an obvious increase in fishermen activities has been observed, especially an increase in the use of the now freely available cheap imported gillnets.

The Integrated Management of the Zambezi/ Chobe River System Fishery Resource Project sees an urgent need for assessing the fishing pressure in the study area. Such a study should take the form of a census or frame survey covering all fishermen together with their gear and basic socio-economic information. Many of the present questions on overfishing and future fisheries management can then be answered.

This is an enormous task that cannot be undertaken by one person alone and should be a concerted effort by all the available staff of the MFMR in the region supported by the Zambezi/Chobe Project. As the floodplain is not confined to Namibia alone, the support of the fisheries departments of neighbouring states was solicited and obtained.

The frame survey could be realized when the Ministry of Fisheries and Marine Resources agreed to make arrangements for the input of four officials from the MFMR working in two independent teams each consisting of three/four persons. The Project contributed with logistics [one boat and one vehicle], three persons, organization, preparation of forms and data collection and analysis.

2 METHODS AND STAFF

The frame survey was undertaken by staff of the Ministry of Fisheries and Marine Resources in conjunction with persons supplied by the Zambezi/Chobe Fisheries Project. In addition, staff from the Department of Fisheries of Zambia and the Department of National Parks and Wildlife of Botswana took part. Some extra staff were hired by the Zambezi/Chobe Fisheries Project(ZCFP) to assist in Zambia and in Namibia. Table 1 lists the persons directly involved in the survey.

Table 2.1 List of participants of Zambezi/Chobe frame survey 2008

Country	Name	Position
Namibia	Mike Ekandjo	MFMR Katima Mulilo
Namibia	Albert Mutelo	MFMR Katima Mulilo
Namibia	Bernard Sezuni	MFMR Katima Mulilo
Namibia	Dominic Mwanamwali	MFMR Kamutjonga
Namibia	Jason Endjala	MFMR Kamutjonga
Namibia	Ben van der Waal	Zambezi/Chobe Project
Namibia	Collins Makandauko	Zambezi/Chobe Project
Namibia	Hazel Songa	Zambezi/Chobe Project

Country	Name	Position
Namibia	Robert Kaapala	Zambezi/Chobe Project
Namibia	Sarafinah	Zambezi/Chobe Project, temporary
Namibia	Tessa	Zambezi/Chobe Project, temporary
Namibia	Simataa	Zambezi/Chobe Project, temporary
Namibia	Joubert Maezi	Zambezi/Chobe Project, temporary
Namibia	Malumo	Zambezi/Chobe Project, temporary
Zambia	Litya Litya	MoF, Zambia
Zambia	Moses	MoF, Zambia
Zambia	Peter Bunonge	MoF, Zambia
Zambia	Kigan	Zambezi/Chobe Project, temporary

The frame survey was planned for the driest part of the year when all fishing villages along the Zambezi could be reached by vehicle or boat. The area in Caprivi was divided into two and two teams undertook the survey simultaneously, one operating along the Zambezi, supported by one or two vehicles and a boat. The second team operated along the Chobe and did not require a boat unless at the very eastern tip near Impalila Island. The Zambian team partly joined the team operating along the Zambezi, using the boat to reach some fishing camps in the Zambian side. Other villages were reached by vehicle or motor bike. The Zambezi/Chobe Fisheries Project supplied some of the transport, fuel, camping equipment for staff in both Namibia and Zambia and other logistics to enable the survey to run smoothly. MFMR staff from Katima Mulilo acted as leaders of the two teams. The surveys were started in September 2008 and ended in December after some delays occurred. All targeted villages and camps could be reached by road or else by engine powered boat.

A frame questionnaire form used previously by the Department of Fisheries in Zambia for an earlier frame survey was used as basis and expanded or simplified where possible. To simplify entering of the data, options for possible answers were listed below every question on forms that could then be coded in the form to make capture easier. A copy of the questionnaire is attached [**Appendix1**].

An attempt was made not to influence the fisher's opinion by asking neutral questions and suggesting many possible answers to choose from. This seemed to have worked well as even sensitive questions on possession of fishing licenses produced revealing results.

The questionnaire [**Appendix 1**] was divided into 6 pages with the following headings:

- FORM A: VILLAGE/FISHING CAMP CHARACTERISTICS
- FORM B: FISHER'S CHARACTERISTICS
- FORM C: FISHING GEAR
- FORM D: FISHING ACTIVITY
- FORM E: PRESENT RESOURCE MANAGEMENT
- FORM F: FUTURE RESOURCE MANAGEMENT/KNOWLEDGE OF EUS

3 RESULTS

Results are presented under a number of topics as follows:

3.1 FISHING VILLAGES AND FISHING CAMPS

The total number of persons, fishers and boats in every village and fishing camp visited was determined by questioning the village headman in each village or fishing camp and obtaining these figures. It is acceded that some information may not be correct or was not correctly interpreted as it was directly obtained from the local headman of a village, some of whom were illiterate. In total 575 settlements, fishing camps and villages were visited, hosting 32 300 persons or 9 188 households.

Distribution of villages and fishing camp and fishers in the study area

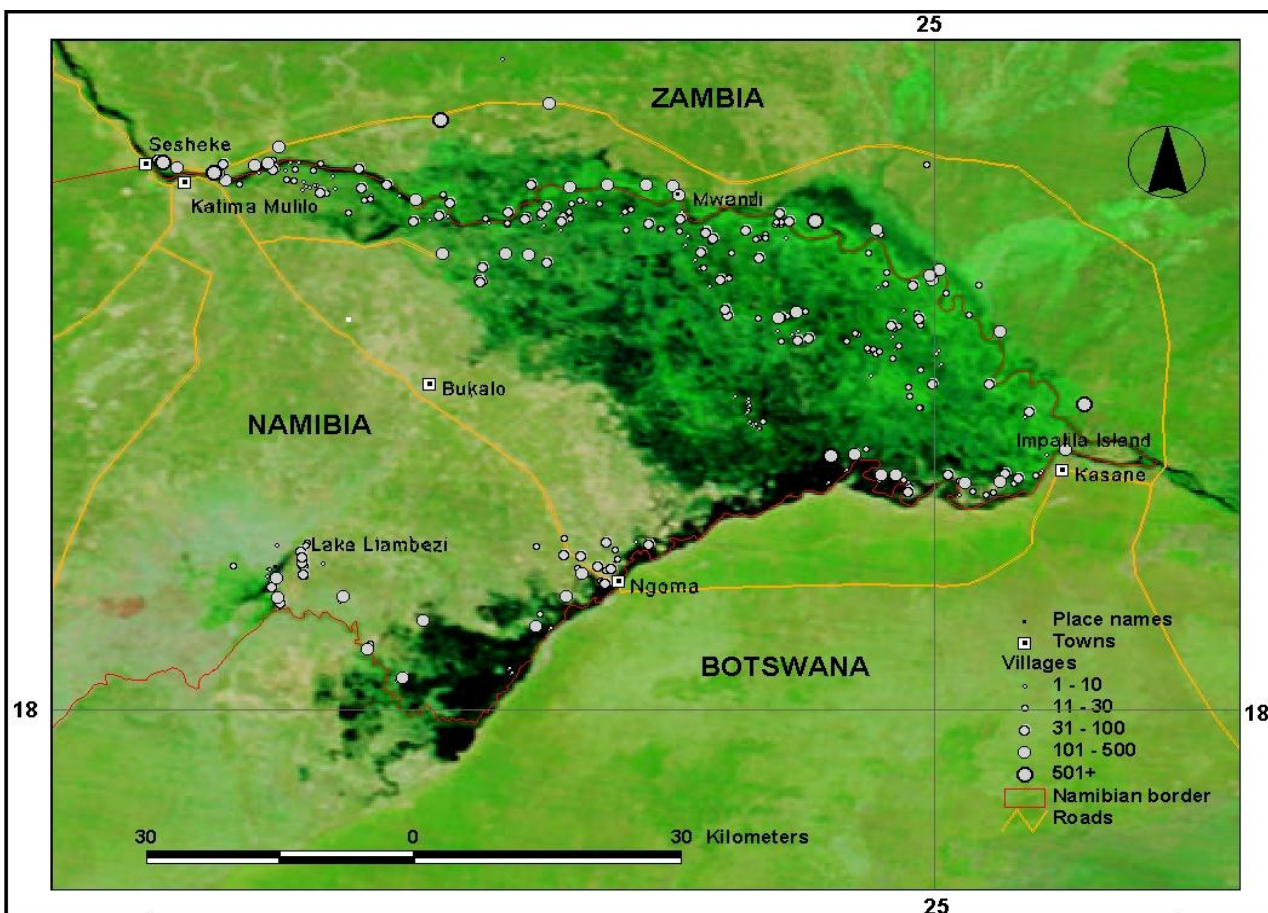


Figure 3.1.1 Fishing villages on the Zambezi/Chobe floodplain in Zambia and Namibia that were visited by the frame survey teams and GPS readings taken for. Number of persons in village indicated on legend. Background map is 08 May 2008 with courtesy from Modis showing extent of flooding in the 2008 season. Water has passed the constriction beyond Ngoma but not yet reached Lake Liambezi which filled a few months later.

The villages and fish camps visited in Namibia and Zambia, are shown in **Figure 3.1.1**. The background of the map was taken from Modis Satellite Imagery (Aqua Series) on 8 May 2008, close to the date the flood reached a maximum on the flood plain. The maps show that the major part of the flood plain in Namibia was covered as well as the more limited flood plain in Zambia. Villages and camps were divided into size categories and shown with different sized dots. In **Figure 3.1.2** the actual number of fishers reported to live in these villages or fishing camps are shown, again in size

categories. Larger villages and concentrations of fishers are prominent on the Zambian side of main channel of the Zambezi with fewer larger villages on the Namibian side. Smaller villages or camps are more scattered away from the Zambezi in the floodplain in Namibia. Some parts of the eastern edge of the flood plain did not harbor any permanent waters where fishers were concentrated.

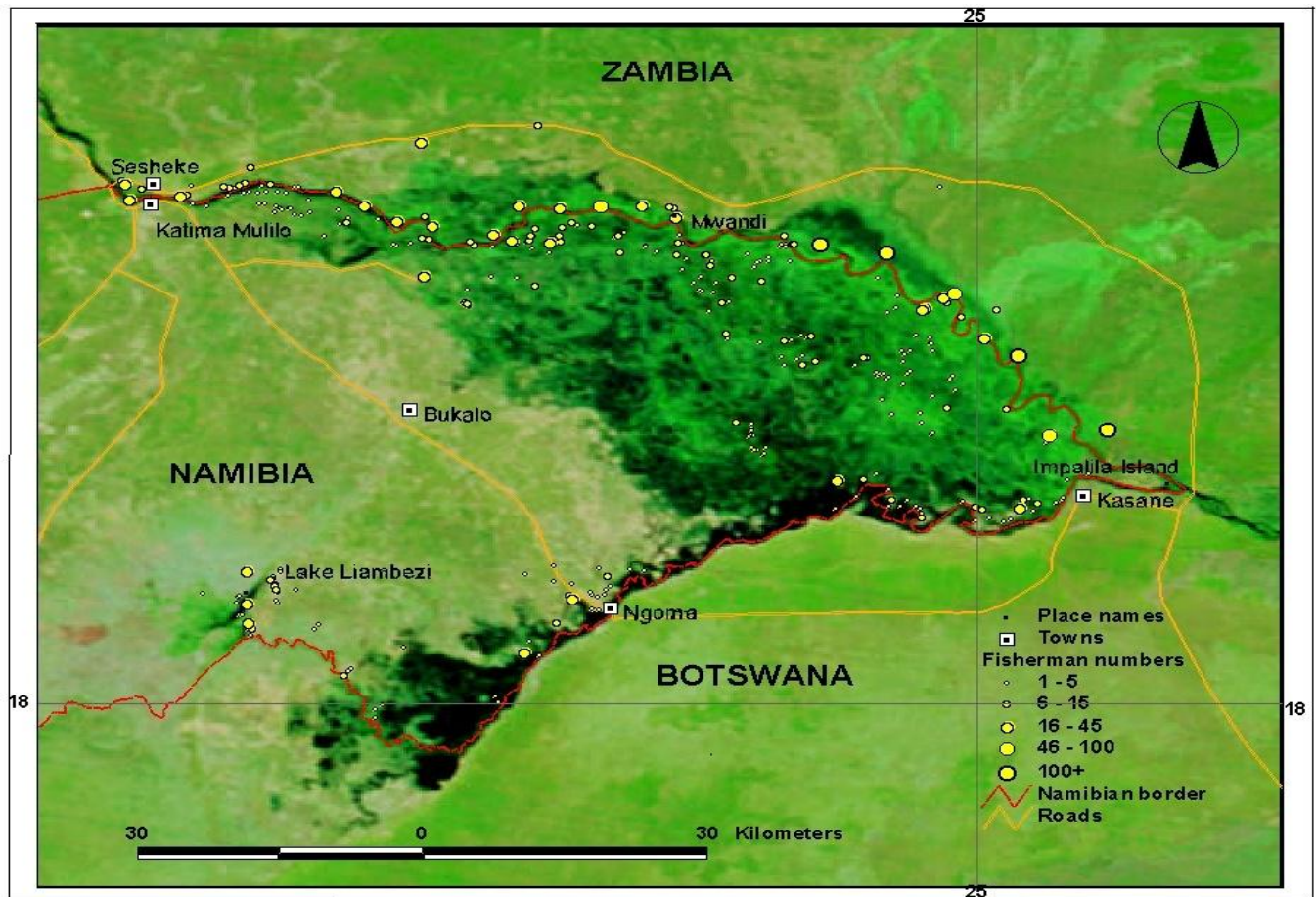


Figure 3.1.2 Distribution of recorded fishers in fishing camps and villages in Namibia and Zambia that were placed on GPS, surveyed during the frame survey. Number of fishers in villages or fishing camps is indicated on legend. Background is a map for 08 May 2008 with courtesy from Modis showing extent of flooding in the 2008 season.

Information on villages and fishers included in this frame survey

Table 3.1.1 summarises totals of recorded villages/fishing camps, population size of such villages, household number, fishers and craft for the Zambian and Namibian sections of the floodplain separately, this data is the accumulation of data as collected from village headmen, not a headcount. Some of the data differ slightly from those collected from the fishers themselves (such as number of dependants) this is due to the source of information, some from illiterate headmen. The total estimated number of persons in the villages and fishing camps on the floodplain in Zambia was not very much lower [15 256] than the estimated [from headman data] population in Caprivi [17 044], although the area covered was much larger in Caprivi than in Zambia [Figure 3.1.1 and 3.1.2]. There is also a distinction between village/fishing camp size in Namibia and Zambia. In Zambia villages or fishing camps were large with on average a population of 171 persons compared to Namibia where the mean value was only 35. The family size in both Namibia and Zambia in the fishing villages was lower (3.8 and 3.2) than the values reported elsewhere [Mendelsohn and El Obeid 2003] or reconstructed from individual fishers questionnaires [Figure 3.3.8]. Information from villages indicated a low number of

canoes [mikolo] per fisher was 0.78 in Namibia and 0.68 in Zambia, possibly an underestimation as questionnaires from fishers indicated more than one canoe per fisher [see Section 3.4]. As expected, the number of engine powered boats is low on both sides but nevertheless demonstrating a new tendency of commercialization. Some of these boats are however used for transport of people on the river.

Table 3.1.1 Summary data on number of villages, persons, fishers and canoes from village headmen [manduna] reports

	Namibia	Zambia	Total
Number of villages/camps visited	486	89	575
Total number of persons in villages/camps	17,044	15,256	32,300
Average number of persons per village/camp	35	171	56
Total number of households	4,480	4708	9,188
Average number of persons per household	3.80	3.24	3.52
Total number of canoes	2,140	2,028	4,168
Total number of engine powered boats	11	11	22
Total number of fishermen	2,754	3,000	5,754
Percentage fishers per village/camp	16.2	19.7	17.8
Average number of fishers per village/camp	5.7	33.7	10
Average number of canoes per fisher	0.78	0.68	0.72

The number of villages and camps in Zambia is far lower than in Namibia but the larger population size of such camps compensates this somewhat so that the total number of households, fishers and canoes is about equal on the Zambian and Namibian side.

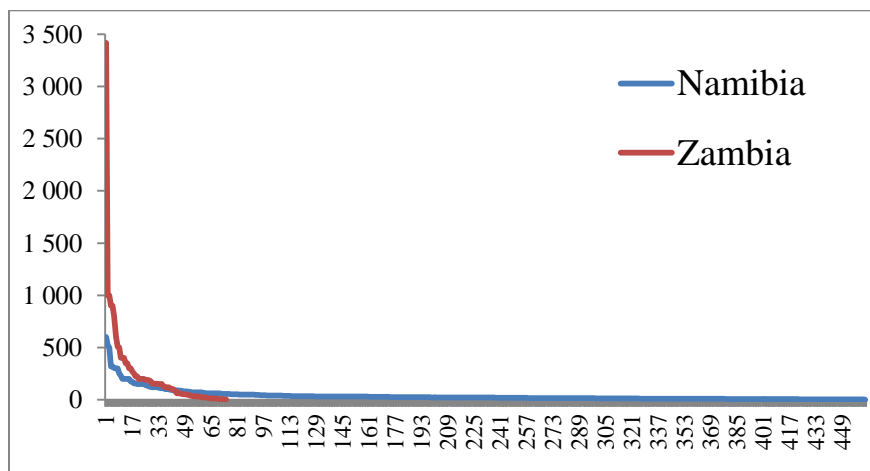


Figure 3.1.3 Population size distribution of fishing villages and fish camps in Namibia and Zambia

In Zambia a much lower number of fishing villages was recorded but the number of persons per village/camp were considerably higher than in Caprivi [Table 3.1.1 and Figure 3.1.3] This may indicate a shortage of suitable sites on higher ground for villages and fishing camps on the Zambian side, resulting in a congestion of people at suitable locations. Another difference is that in Zambia there are comparatively more temporary fishing camps than in Caprivi [see Figure 3.1.4].

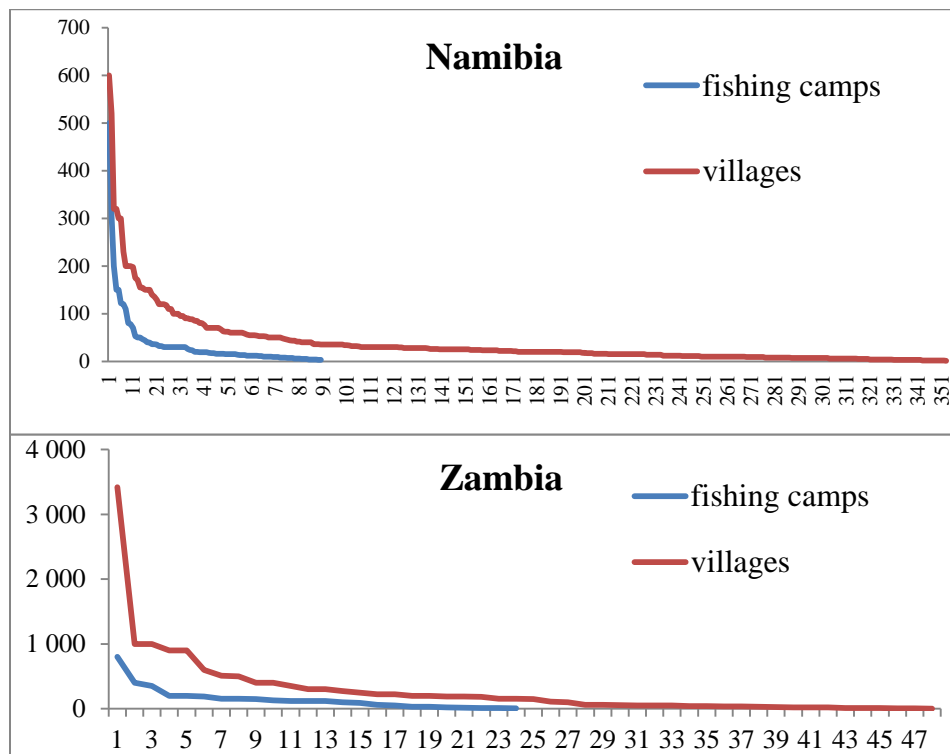


Figure 3.1.4 Population size distribution of all villages and fishing camps recorded on the Namibian and Zambian side of the Zambezi.

Age of villages and fishing camps

The recorded ages of fishing villages and fishing camps on both sides of the Zambezi are shown in Figure 3.1.5. Villages with recorded ages of up to 250 years were found. This is quite possible as established villages existed already when the first explorers like David Livingstone visited the area in the 1850's. A large difference exists between the age distribution of villages and camps on the two sides of the Zambezi with Namibia reflecting many small and young settlements in the extensive floodplains. The Zambian side is more densely populated with larger villages on all suitable higher lying sites.

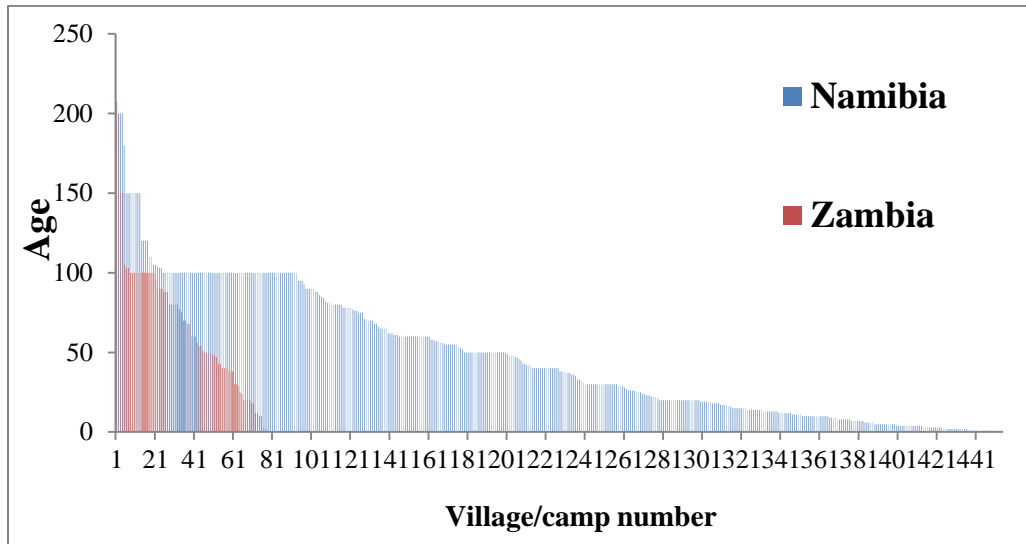


Figure 3.1.5 Age distribution of villages and fishing camps [combined] on the Namibian and Zambian side of the Zambezi River.

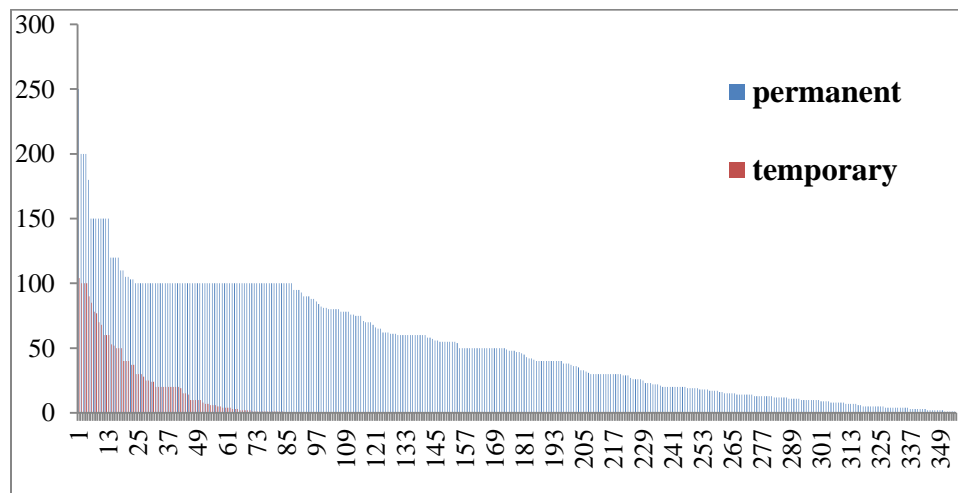


Figure 3.1.6 Age distribution of permanent villages and temporary fishing camps on the Namibian side of the Zambezi River.

It appears the villages and temporary fishing camps are usually well established and more than half already older than 40 years with 90 out of the 450 villages and camps 100 years or older on the Namibian side, This is in contrast with another third of the villages and camps that are of recent origin and only 30 years or less old. 65 of the sites were actually 5 or less years old. On the Zambian side only one out of 88 villages was reported as 5 years or less. The average age of villages in Namibia is 53 but camps were on average only 26 y old, indicating many are of recent origin. In Zambia far fewer villages or fishing camps of 20 or less years were evident. The conclusion can be drawn that on the Zambian side, there is no recent expansion of new fishing camps – the average age of fishing camps [64 y] and villages [67 y] seem to be quite old.

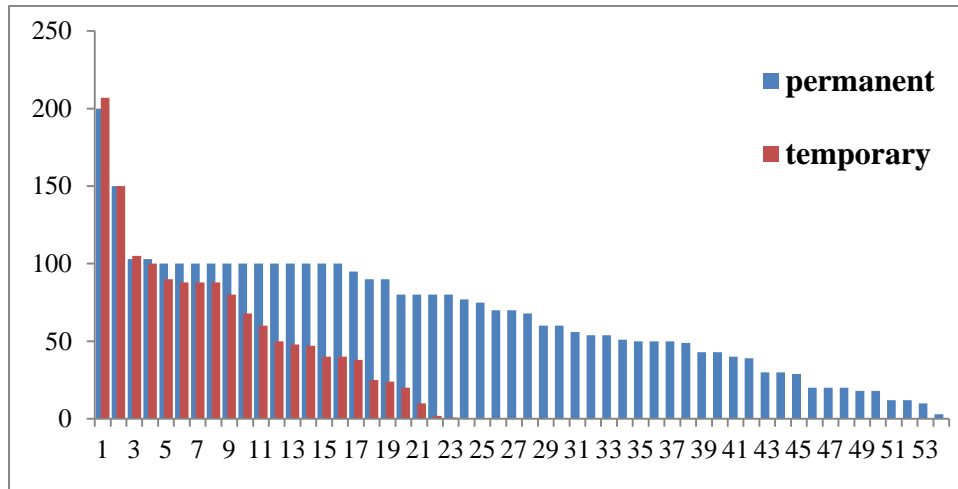


Figure 3.1.7 Age distribution of permanent villages and temporary fishing camps on the Zambian side of the Zambezi River.

Agricultural activities of people in villages and fishing camps

The headmen and /or representatives of each village or camp were asked what other activities apart from fishing is undertaken. Almost all indicated that farming is the main activity and **Figure 3.1.8** gives a breakdown of the frequency in which crops are planted in the respective villages or camp. A very low percentage indicated that they fish only, having no other activities at all. Maize is planted in about 90% of the villages, followed in Namibia by pumpkins, sorghum, vegetables, millet and beans. In Zambia vegetables, sorghum, beans, cassava and sweet potatoes are planted more regularly than in Namibia. This set of data should be seen as a statement of the general activities in the villages where fishers now living in fishing camps, come from and does not reflecting the situation in many temporary fishing camps where none or little planting is conducted. Some small fields were however personally seen at many temporary fishing camps.

In **Figure 3.1.9** the areas where crops are planted on the floodplain are indicated on the basis of whether the fields are on the floodplain, and thus liable to become flooded, or in the uplands where no flooding takes place normally. As expected, the lower lying feature of Caprivi are reflected in the data. The difference in types of crops planted on both sides of the Zambezi may also be related to the type of soils available.

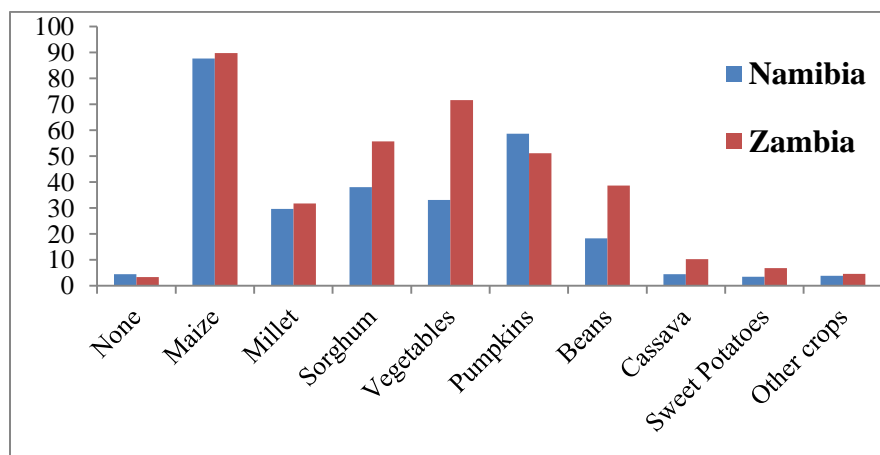


Figure 3.1.8 Agricultural activities in villages for the Zambian and Namibian side of the Zambezi.

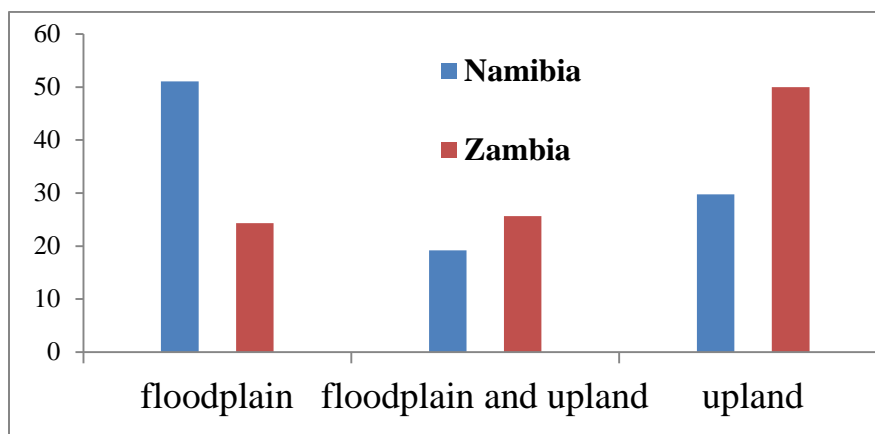


Figure 3.1.9 Type of place where crops are grown in Namibian and Zambian villages.

3.2 INFORMATION ON FISHERS PARTICIPATING IN SURVEY

Number of fishers surveyed

At every village or fishing camp visited, all [if a small number] or representative [if more than ten] number of the fishers available and willing to participate in the survey, were questioned and the data collected analysed and represented in this section. **Table 3.2.1** summarizes the number of fishers per area included in the survey. As result of the uneven distribution of fishers, some areas with many villages and fishing camps are represented by larger numbers.

Table 3.2.1 Number of fishers participating in the questionnaire survey from areas in Namibia and Zambia

Number of Fishermen included in survey by Area				
NAMIBIA		ZAMBIA		Area name not stated
Ibbu	4	Ilyango	1	168
Ikaba	95	Kasaya	35	
Imbu	1	Katongo	48	
Impalila	30	Katundu	6	
Imukusi	3	Kazungula	7	
Ioma	2	Mabumbu	20	
Isize	5	Mambova	28	
Kabulabula	60	Mangamu	1	
Kalimbeza	37	Maondo	118	
Kasika	87	Mwandi	49	
Kasikili	1	Nanombe	3	
Lisikili	51	Ngwezi Malo	72	
Ikaba	3	Sesheke	78	
Lusese	16	Sikute	7	
Mahundu	7	Simawewe	2	

Table 3.2.1. Continued

NAMIBIA		ZAMBIA		Area name not stated
Malindi	29	Simungoma	77	
Maningimanzi	1	Sisikwe	26	
Masanga	2	Zambezi Sawmill	2	
Masokotwani	1			
Mbalasinte	4			
Munzi	3			
Musanga	26			
Muyako	62			
Muzili	4			
Nakabolelwa	74			
Nakuntwe (Ikaba)	11			
Nfoma	14			
Ngala	2			
Ngoma	29			
Nsundwa	24			
Ntoma	1			
Sakutiya	1			
Schuckmannsburg	27			
Sisheshe	1			
Zilitene	7			
TOTAL	725		580	168
Grand Total				1473

Gender and age composition of fishers surveyed

Table 3.2.2 summarises information on gender composition of fishers surveyed. This is further exposed in **Table 3.2.3** and **Figure 3.2.1** where the age composition in 5 year age groups is presented for Zambia and Namibia respectively.

Table 3.2.2 Total number of male and female fishers recorded in frame survey samples for the Chobe/Zambezi floodplain

Age group	Female	Male	Total
10 - 19	3	35	38
20 - 24	1	121	122
25 - 29	5	258	263
30 - 34	8	235	243
35 - 39	7	240	247
40 - 44	4	149	153
45 - 49	1	110	111
50 - 54	1	64	65

Table 3.2.2. Continued

Age group	Female	Male	Total
55 - 59		48	48
60 - 64	2	44	46
65 - 69	4	39	43
70 +		38	38
Total	36	1381	1417

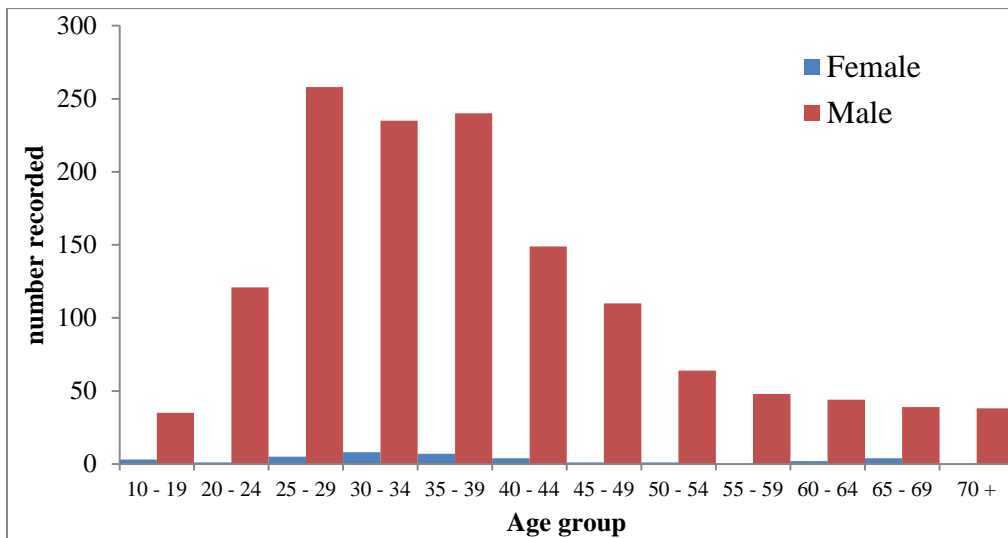


Figure 3.2.1 Age distribution of all fishers [n=1473] included in the frame survey

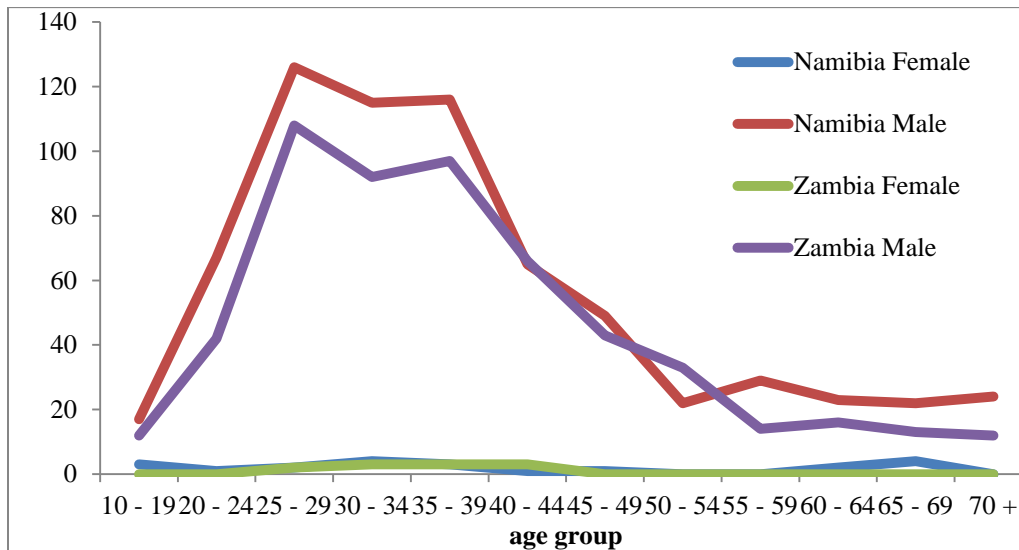


Figure 3.2.2 Number of male and female fishers sampled in 5 year age groups on the Namibian and Zambian side of the river

Table 3.2.3 Percentage composition of male and female populations of fishers in Zambia and Namibia

	NAMIBIA		ZAMBIA		
Age Group	Namibia Female	Namibia Male	Zambia Female	Zambia Male	Total
10 - 19	14.3%	2.5%	.0%	2.2%	4.74%
20 - 24	4.8%	9.9%	.0%	7.7%	5.59%
25 - 29	9.5%	18.7%	18.2%	19.7%	16.52%
30 - 34	19.0%	17.0%	27.3%	16.8%	20.04%
35 - 39	14.3%	17.2%	27.3%	17.7%	19.11%
40 - 44	4.8%	9.6%	27.3%	12.0%	13.43%
45 - 49	4.8%	7.3%	.0%	7.8%	4.97%
50 - 54	.0%	3.3%	.0%	6.0%	2.32%
55 - 59	.0%	4.3%	.0%	2.6%	1.71%
60 - 64	9.5%	3.4%	.0%	2.9%	3.96%
65 - 69	19.0%	3.3%	.0%	2.4%	6.17%
70 +	.0%	3.6%	.0%	2.2%	1.44%

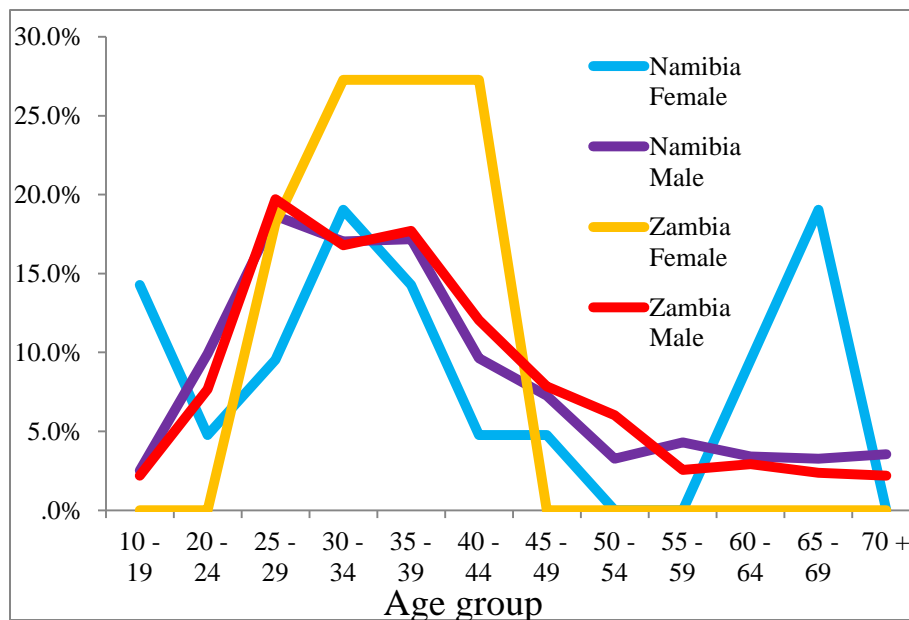


Figure 3.2.3 Percentage composition of male and female fisher populations sampled by frame survey in Namibia and Zambia

Tables 3.2.2-3 and Figures 3.2.1-3 show that the fishers population as sampled by the frame survey was dominated by young to middle aged men on both sides of the river. Women formed a very small part of the fishers as their usual traditional role is rather that of fish trader [Purvis 2002]. The age composition demonstrated a higher component of men in the 25 to 40 year age groups especially in Zambia but not the high recruitment rate expected by young men due to unfavorable farming conditions and increased pressure on the fisheries by people trying to obtain cash income. Entry into the occupation seems to occur in the 25-40 year age groups on both sides of the Zambezi.

Comparing the graphs on the two sides of the river, there is almost no difference, demonstrating similar trends in age composition and recruitment on both sides of the river. It is noteworthy that the

trend from 55 to 70 plus is almost horizontal without the expected drop with higher age signifying a low drop-out.

The age group pattern of females participating in fishing in Namibia differs from that of the general pattern in males and also females in Zambia. More young as well as older females seem to participate in Namibia but actual numbers are low [total female fishers recorded was 36].

Citizenship of fishers in Namibia and Zambia

Questions on citizenship were asked at the end of each personal interview in such a way that no confrontation was caused. **Table 3.2.4** and **Figure 3.2.4** summarise the number and percentage nationality of fishers surveyed on both sides of the river. The percentage [and actual number] of Namibian fishermen recorded in Zambia [4.1%] is much less than of Zambians [23.7%] recorded in Namibia. This situation reflects the concerns expressed repeatedly by local traditional authorities in Caprivi and of the MFMR. Some Zambians found in Namibia were found herding cattle whilst also fishing part-time for Namibian employers. Most of these Zambians voluntarily showed their identification documents but had not entered through official border posts.

Table 3.2.4 Composition by nationality of the fishing communities recorded in Namibia and Zambia.

Country where fishers were recorded	Citizenship			Total
	Namibian	Zambian	Other	
In Namibia	567	177	4	748
% in country	75.80	23.66	0.53	100
In Zambia	23	536	3	562
% in country	4.09	95.37	0.53	100
Riverside Not Stated	43	118	2	163
%	26.38	72.39	1.22	100

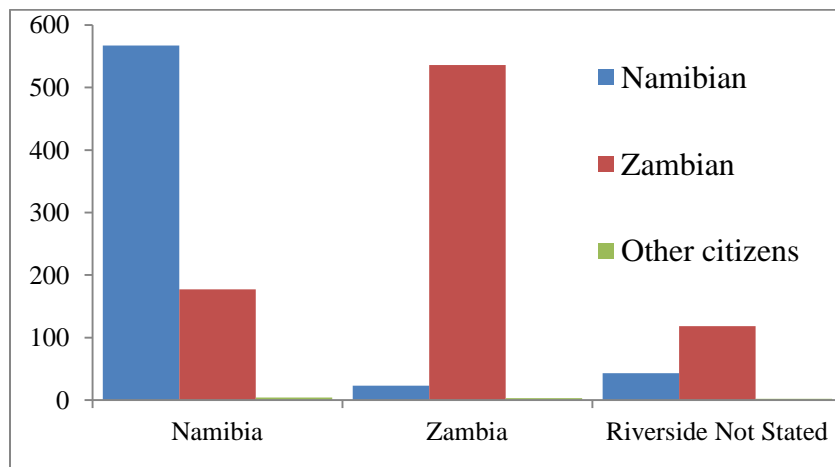


Figure 3.2.4 Number of fishers having Namibian, Zambian and other nationality recorded on both sides of the Zambezi

Languages spoken by fishers

All fishers questioned were asked about their mother language and **Table 3.2.5** and **Figure 3.2.5** summarise the distribution of languages spoken by fishers.

Table 3.2.5 Number and percentage (in brackets) composition of languages spoken by fisher on the Namibian and Zambian side of the Zambezi

Riverside					
Language group	Namibia	Zambia	Riverside Stated	Not	Total
Silozi	334(44.6)	477 (84.9)	130 (79.8)		941 (63.9)
Subia	378 (50.5)	10 (1.8)	24 (14.7)		412 (28.0)
Sifwe	4 (0.5)		1 (0.6)		5 (0.3)
Mbukushu	7 (0.9)				7 (0.5)
Mbunda	7 (0.9)	18 (3.2)	2 (1.2)		27 (1.8)
Tokaleya	4 (0.5)	13 (2.3)			17 (1.2)
Tonga	1 (0.1)	10 (1.8)	2 (0.6)		13 (0.9)
Bemba		10 (1.8)	1 (1.2)		11 (0.8)
Totela	2 (0.3)				2 (0.1)
Chokwe		2 (0.4)			2 (0.1)
Others	11 (1.5)	20 (3.6)	2 (1.2)		33 (2.2)
Not Stated		2 (0.4)	1 (0.6)		3 (0.2)

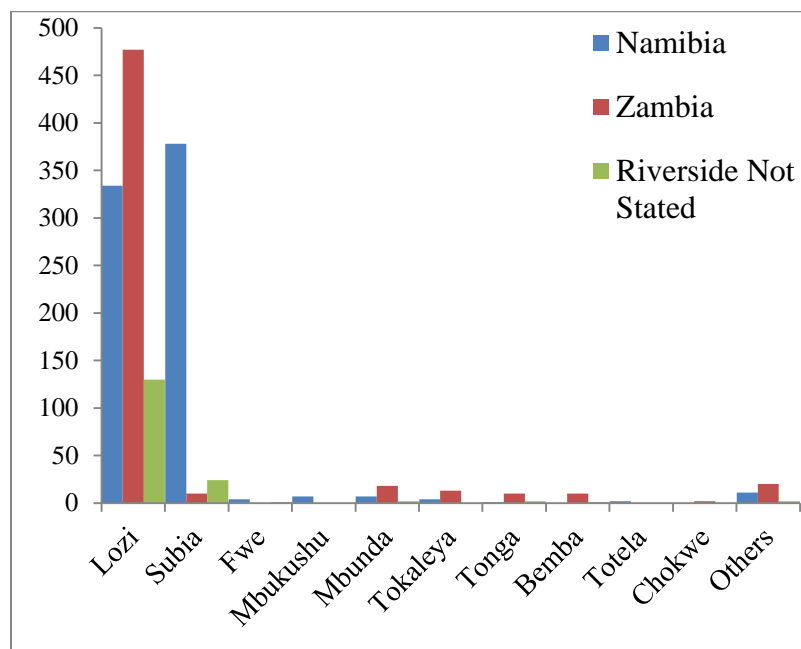


Figure 3.2.5 Mother languages of fishers on the Namibian and Zambian side of the Zambezi

Tables 3.2.5 and **Figure 3.2.5** explain the position in terms of mother languages of the fishers on both sides of the river. On the Zambian side, Silozi dominates completely with 85% but the closely related Sisubia is only used by 0.02% whilst in Namibia Sisubia [closely related to Silozi] is the home

language of 51% of the fishers but with Silozi forming a second 45%. The total percentage of northern Zambian languages is 0.04% and 0.13% respectively for Namibia and Zambia. Although the percentage of other language groups is three times higher than in Namibia [where fishers speaking Namibian Fwe and Mbukushu were present in very low numbers] the actual number of other language groups is insignificant on both sides of the river. The stated difference in language use between the Namibian and Zambian side is prominent and reflects the history of the area where Lozi people are part of the Barotse (Lozi) kingdom centered near Mongu in the Western Province whilst the eastern Floodplain of Caprivi was occupied by the Basubia who were indirectly related and associated with the Lozi but have been independent for more than a century.

3.3 STATUS OF FISHERS

Employment status of fishers

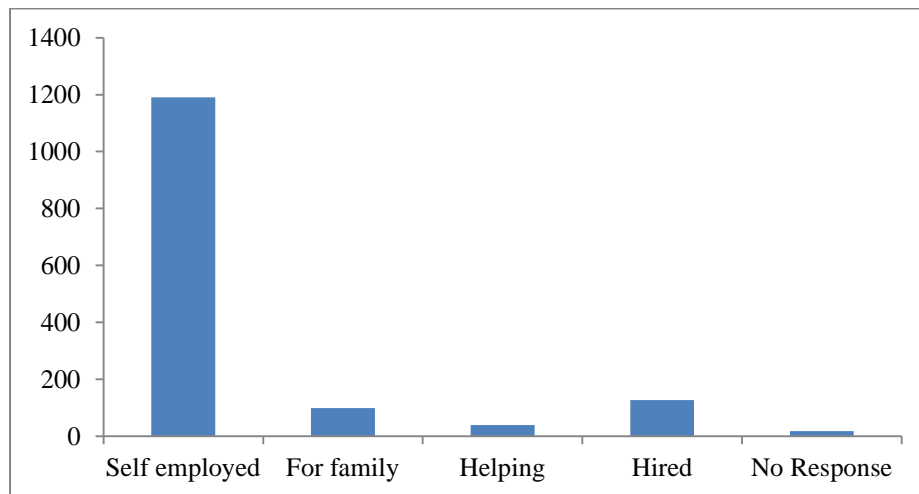


Figure 3.3.1 Employment status of all fishers questioned

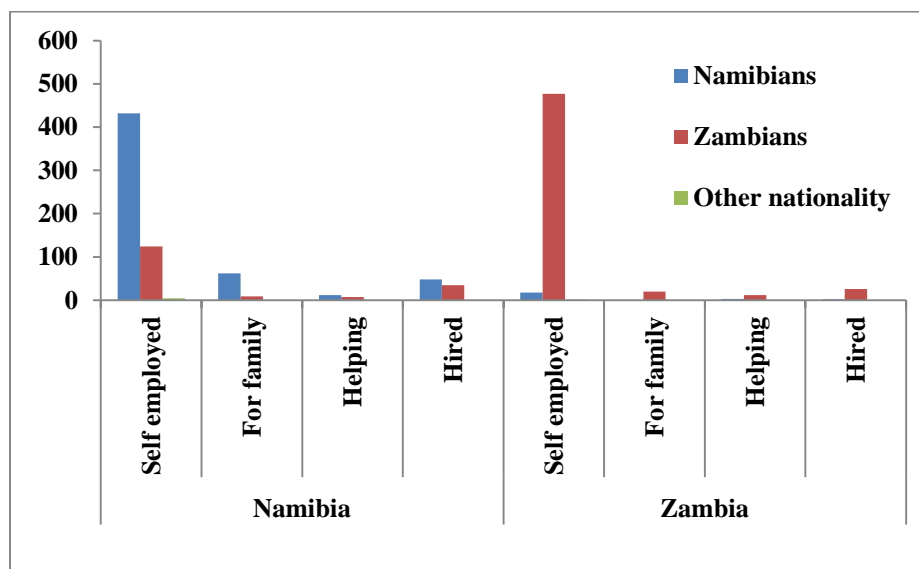


Figure 3 3.2 Employment status of fishers in Namibia and Zambia

80.8% of all fishers are self employed [Figure 3.3.1]. This trend is even stronger in Zambia than in Namibia [Figure 3.3.2]. The high number of independent Zambians in Namibia that fish for themselves [more than 100 recorded in this survey] reflects the situation where many cross the river to fish semi permanently in Namibia, the better fishing ground. There seems to be twice the number of hired persons in Namibia, roughly divided between fishers from Namibia and Zambia. In Zambia there is a lower ratio of hired persons participating in the fishing and consists of Zambians only.

Table 3.3.1 Position of fishers in Namibia and Zambia by citizenship, expressed as percentages.

Country	Status of fishers	Namibians	Zambians	Other nationality
Namibia	Self employed	77.97	70.85	100
	For family	11.19	5.143	0
	Helping	2.16	4.00	0
	Hired	8.66	20.00	0
Zambia	Self employed	78.26	89.19	100
	For family	0	3.74	0
	Helping	13.04	2.24	0
	Hired	8.69	4.86	0

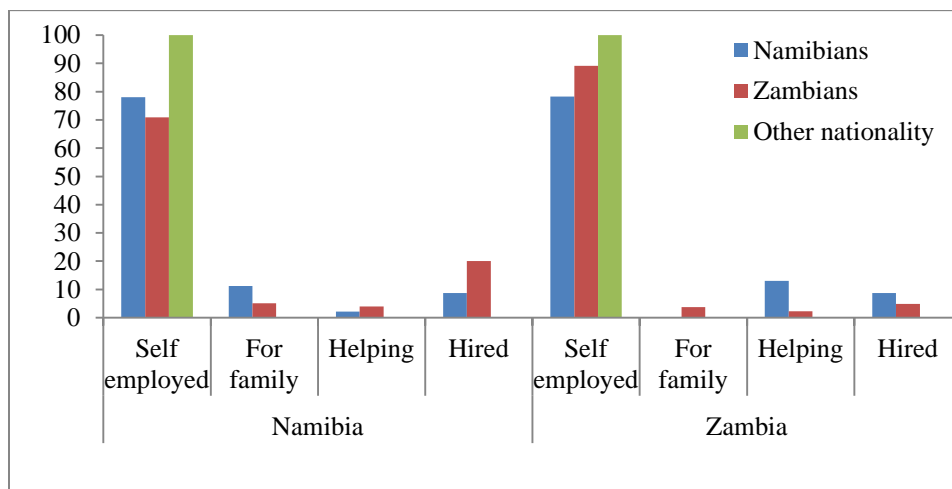


Figure 3.3.3 Employment status of fishermen as citizens in the two countries

These data are expressed in Figure 3.3.3 as percentages in each country to demonstrate the relative higher percentage of Zambians in Namibia that are hired and the lower percentage acting as self employed in Namibia.

Change in employment status as fisher with age

It can be expected that younger persons will enter the market as helpers and become independent fishers at a later age. The actual number of fishers in each age group is represented in Figure 3.3.4 to emphasize the relative numbers and determine if this expectation is reflected. From the 20-24 year age group, self employed fishers dominate in both Namibia and Zambia. Younger persons fish for their families or are hired. Above 50 years, very few fishermen do not fish for themselves. In Figure 3.3.5. the relationships are expressed as percentage of each age group to facilitate comparison.

Expressed as percentages, the distribution of employment status is a bit more spread out amongst all age groups, again with more younger persons acting in a supportive role.

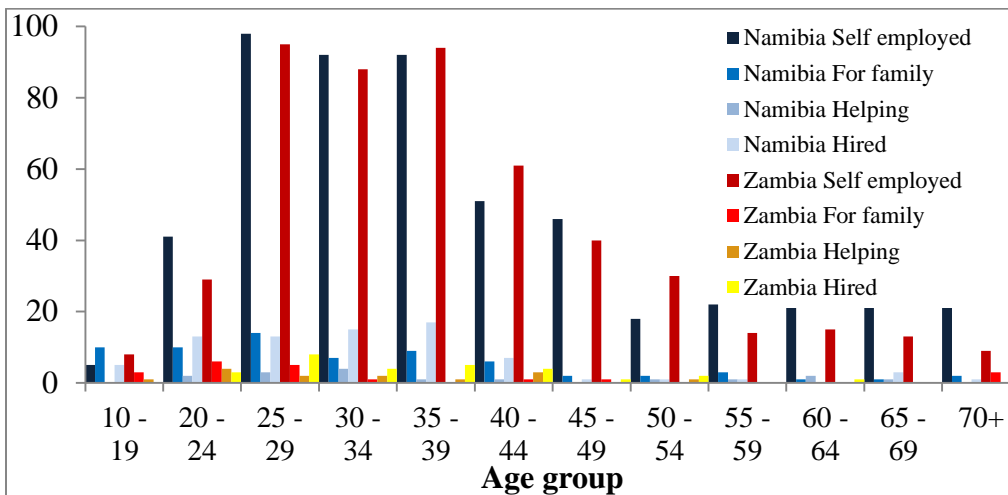


Figure 3.3.4 Change with age of the employment status of fishers, actual numbers recorded

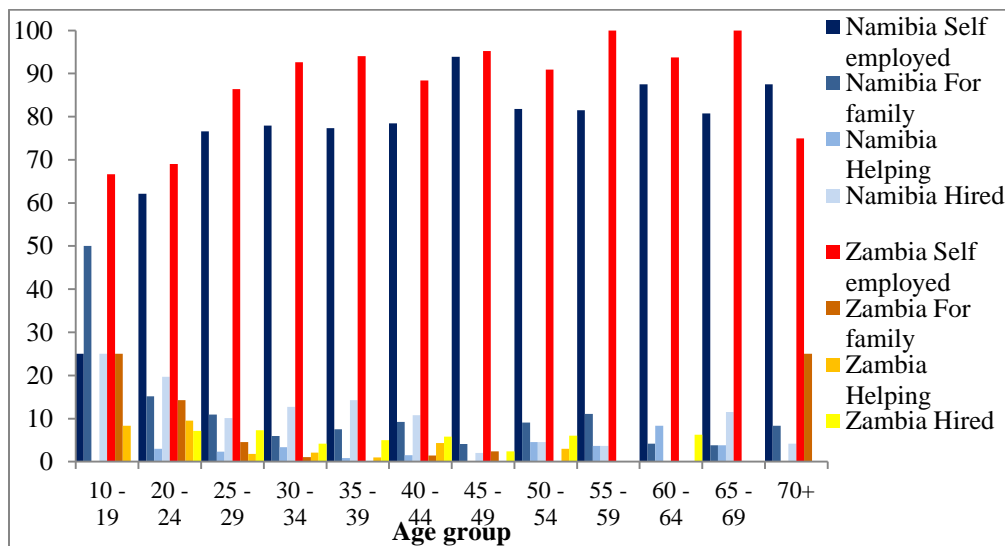


Figure 3.3.5 Percentages of employment status of fishers amongst age groups.

Position of fishers in households

By far most fishermen are heads of households [Table 3.3.2 and Figure 3.3.6]. In Zambia the portion by heads of households is even higher [92%] but in Namibia more direct relatives of the head are involved in fishing. There is also an indication that domestic workers fishing for someone else, is more common in Namibia than in Zambia.

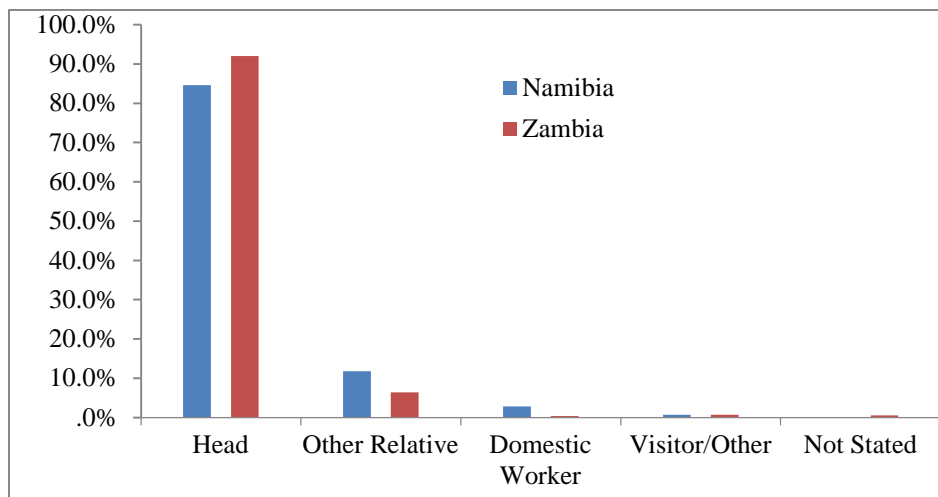


Figure 3.3.6 Position of fishers in households in Zambia and Namibia expressed as percentage

Table 3.3.2 Position of fishers in households in Namibia and Zambia

Position in household (Re-grouped)	Namibia	Zambia	Riverside Stated	Not	Total
Head	84.6%	92.0%	84.0%		87.4%
Other Relative	11.8%	6.4%	9.8%		9.5%
Domestic Worker	2.8%	.4%	3.1%		1.9%
Visitor/Other	.7%	.7%	2.5%		.9%
Not Stated	.1%	.5%	.6%		.3%

There is also a change with age in the position fishers occupy in households. Data are presented in **Table 3.3.3.** and the percentages offered in **Figure 3.3.7** for comparison.

Table 3.3.3 Position of fishers in households by age groups

Age Group (5 year intervals)	Head	Other Relative	Domestic Worker	Visitor/Other
10 - 19	13	24	1	
20 - 24	73	39	10	
25 - 29	222	36	2	2
30 - 34	215	19	7	2
35 - 39	233	8	4	2
40 - 44	148	3		2
45 - 49	109	1		1
50 - 54	60	4	1	
55 - 59	44	1	1	2
60 - 64	45		1	
65 - 69	41			2
70+	38			

In most households, the head is also the fisher but the frequency increases from a low 34% to 100% in the age groups 25 to 70+ years [Figure 3.3.7]. Correspondingly, relatives of the family head decrease from 63% in the 10-19 year group to a percentage of 0-6 above an age of 35.

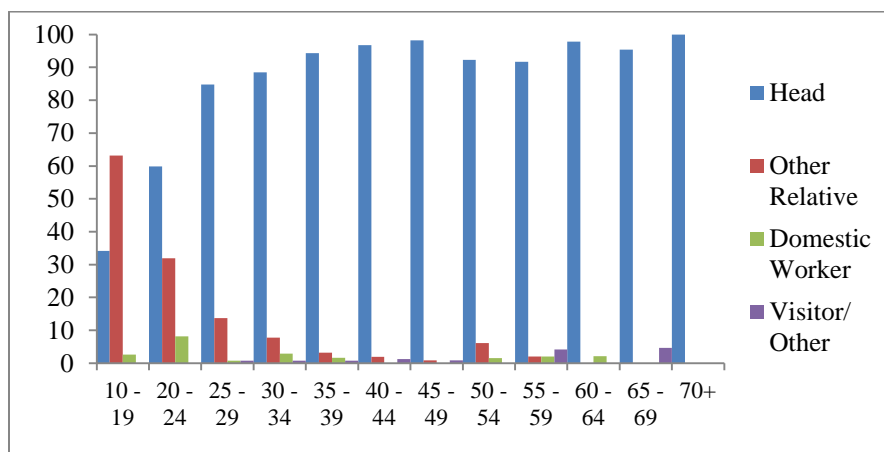


Figure 3.3.7. Change with age of the position of fishers in their households expressed as percentage

Number of dependants in households of fishers

The analysis of number of dependants in the household of which the fisher is part, is presented in Table 3.3.4. The average number of dependants of 5.3 in both Namibia and Zambia is very close to the expected value for rural areas in the region as reported by Mendelsohn and Roberts (1999) (5.4), but higher than information collected from indunas of fishing villages where the number of dependants was low, especially in Zambia. This lower value may reflect the actual situation in fishing camps whereas the questions asked to fishers was interpreted to refer to the situation in the village where the fishers originate. The distribution of number of dependants per household is presented in Figure 3.3.4 and illustrated in Figure 3.3.8 for the two sides of the river separately. The number of dependants increases with the age of the fisher [mostly the head of households] with a maximum of nearly eight dependants [Figure 3.3.9].

Table 3.3.4 Percentage distribution of number of dependants in households of fishers in Namibia and Zambia

No of dependants	NAMIBIA	ZAMBIA
0	2.8	2.7
1	7.1	5.4
2	11.6	8.4
3	16.2	12.5
4	12.8	14.5
5	12.6	16.2
6	10.7	12.8
7	6.6	8.8
8	5.3	7.3
9	3.3	2.9
10	2.8	3.4

Table 3.3.4. Continued.

No of dependants	NAMIBIA	ZAMBIA
11	2.4	0.9
12	1.9	1.6
13	0.3	0.5
14	0.2	0.9
15	1.7	0.5
20	0.9	0.5
30	0.9	0.0
31+	0.2	0.1
Average number of dependants	5.28	5.27

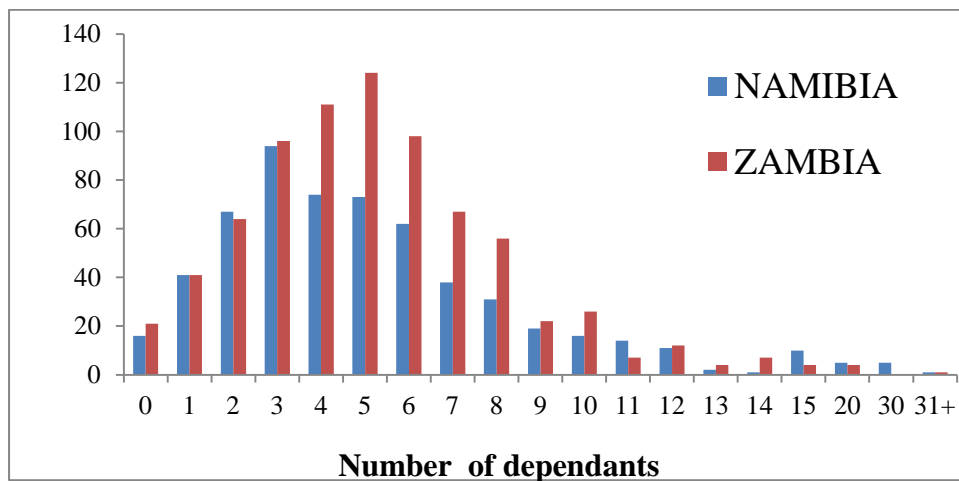


Figure 3.3.8. Distribution of the number of dependants of fishers in Namibia and Zambia

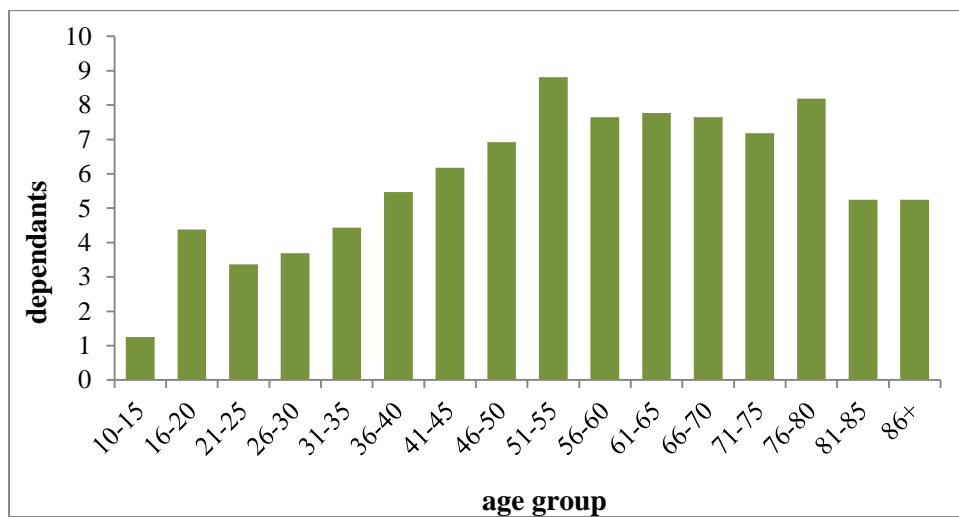


Figure 3.3.9 Change in the number of dependants with change in age of fishers (Namibia and Zambia combined)

Number of years fishers have fished

The information on years fished as recorded from all fishers on both sides of the Zambezi is summarized in **Tables 3.3.5** and **3.3.6** and **Figure 3.3.10**. On both sides of the Zambezi the number of fishers fishing for 10 years or less is three times as high as fishing 11 to 20 years or four times as high as older fishers fishing more than 20 years. Fishers that had been fishing for 70 years were recorded in both Namibia and Zambia. **Figure 3.3.10** shows that the pattern of recent recruitment of new fishers to the profession differs between Zambia and Namibia. In Zambia large numbers of fishers entered the profession every year over the past 10 years. In Namibia a large number of fishers entered the profession only very recently – one or two years and recruitment over the previous six years was every year lower. The pattern of number of fishers having fished 16 years or longer, is very similar in both countries. .

Table 3.3.5 Numbers recorded and percentages of years fishers of different nationality have been fishing

Number of Years Fished	Citizenship			Total
	Namibians	Zambians	Other	
1 - 10 years	369	531	5	905
	60.0%	65.2%	83.4%	63.1%
11 - 20 years	135	164		299
	22.0%	20.1%	.0%	20.8%
More than 20 years	111	119	1	231
	18.0%	14.6%	16.7%	16.1%
Total	615	814	6	1435

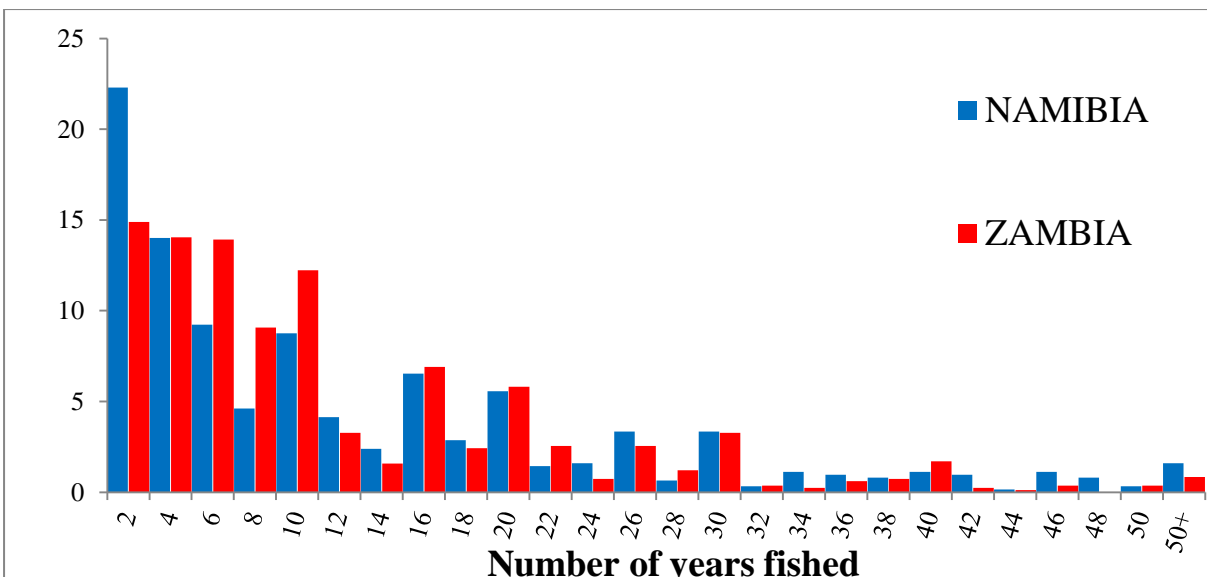


Figure 3.3.10 Distribution of number of years fished by fishers on the two sides of the River

The data for years fished are presented for the different regions in the area [Table 3.3.6], demonstrating large variation in fishers composition from one area to another. This aspect should be

further analysed in future surveys. It is clear that certain areas have a stable population of fishers while in others recent recruitment of new fishers to the ranks has occurred.

Table 3.3.6 Distribution of years fished amongst the fishing areas in Caprivi and Zambia

Name of area	1-10 years	11-20 years	More than 20 years	Total
Area name not stated	97	36	28	161
Ibbu	3	1		4
Ikaba	42	21	29	92
Ilyango			1	1
Imbu			1	1
Impalila	15	8	7	30
Imukusi		2	1	3
Ioma	2			2
Isize	5			5
Kabulabula	38	13	8	59
Kalimbeza	26	8	4	37
Kasaya	21	8	5	34
Kasika	52	21	12	85
Kasikili	1			1
Katongo	27	13	5	45
Katundu	6			6
Kazungula	5	2		7
Lisikili	37	9	4	50
Ikaba		1	2	3
Lusese	13	3		16
Mabumbu	14	4	1	19
Mahundu	6		1	7
Malindi	24		2	26
Mambova	19	5	4	28
Mangamu	1			1
Maningimanzi	1			1
Maondo	80	18	17	115
Masanga	2			2
Masokotwani	1			1
Mbalasinte	2	1	1	4
Munzi	1	1	1	3
Musanga	19	3	2	24
Muyako	48	7	7	62
Muzili	1	1	2	4
Mwandi	26	10	10	46
Nakabolelwa	50	14	9	73

Table 3.3.6. Continued.

Name of area	1-10 years	11-20 years	More than 20 years	Total
Nakuntwe (Ikaba)	6	2	2	10
Nanombe	3			3
Nfoma	8	2	3	13
Ngala	2			2
Ngoma	16	10	3	29
Ngwezi Malo	42	15	15	72
Nsundwa	17	6	1	24
Ntoma	1			1
Sakutiya	1			1
Schuckmannsburg	13	7	6	26
Sesheke	32	32	14	78
Sikute	3	1	3	7
Simawewe	1		1	2
Simungoma	55	7	13	75
Sisheshe	1			1
Sisikwe	13	7	4	24
Zambezi Sawmill	2			2
Zilitene	5		2	7
Total	905	299	231	1435

3.4. FISHING GEAR AND BOATS

Fishing craft used by fishers

The information below was obtained directly from the fishers questioned and these data do differ here and there from the information obtained from village headmen where a sample of fishers was then later questioned individually. Data obtained on fishing vessels used by the fishers during the frame survey, is summarized in **Table 3.4.1** and **Figure 3.4.1**.

The most frequently used vessel for fishing still is the dugout canoe or *mukolo* [Lozi, pl *mikolo*]. This is in spite of a local shortage of suitable large trees to cut mikolo from. Additionally, levies and licenses are to be paid to traditional authorities and the Department of Forestry for permission to cut a tree for a mukolo in community forests. Most of the mikolo used on the Zambezi are imported from further upstream in Zambia south of Senanga where large trees are still available in the many forest reserves and exploitation areas there. From data obtained from fishers the average ownership amounted to 1.44 mikolo per fisher in Namibia and 1.06 in Zambia. In **Table 3.1.1** the number of observed mikolo per fishers are however only 0.78 and 0.68 per fisher in villages in Namibia and Zambia respectively. This lower value is possibly the result of the fact that those data were collected from mainly larger villages where many families do not possess a mukolo. A very low number of other types of fishing

vessels were recorded [Table 3.4.1]. The trend to fish more intensively in Zambia is highlighted by the presence of five engine powered boats recorded for the lower Zambezi flood plain on the Zambian side.

The percentage of engine powered boats as recorded by village headmen [22 in total] contrasts against the 5 recorded from fishers. The percentages of engine powered boats [0.58% and 0.27% respectively] indicate a higher number and proportion of engine driven boats reported by village headmen than fishers themselves and may reflect the fact that motorized boats used exclusively for river transport in the lower section of the Zambezi flood plain where roads are absent, were included.

Table 3.4.1 Total number of all types of fishing vessels enumerated during frame surveys

Country	Mikolo [dugouts]	Fiberglass boats	Engine powered boats	Borrowed Boats	Other Boats	Total
Namibia	1080	1	0	12	3	1096
Zambia	597	0	5	20	15	637
River side not known	180	0	0	6	0	186
Total	1857	1	5	38	18	1919
% of total	96.77	0.05	0.26	1.98	0.94	100

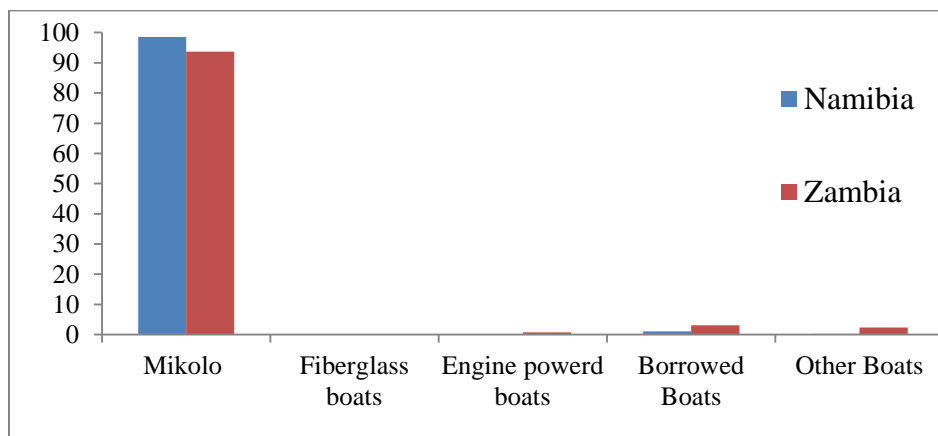


Figure 3.4.1 Percentage ownership of fishing vessels in Namibia and Zambia based on data obtained from fishers.

Number of gill nets owned by fishers

The reported record of the number of nets owned and used by fishers as reported by the fishers included in the frame survey, varied between 0 and 200. Both extreme figures were considered unrealistic for calculation of averages. The frequency distribution of number of nets owned by fishers in Namibia and Zambia is illustrated in Figure 3.4.2. The average number of nets per fisher in Namibia calculated from this median group is just under 4 per person [3.82] but Zambians possess nearly 6 [5.59] nets per fisher. This indicates a higher fishing effort by Zambians, confirming previous perceptions.

Data on the mesh sizes of the nets used was recorded in the questionnaire [Appendix 1] but was not entered in the database mainly as result of difficulty in the interpretation of part of the recordings. This

data is however available and should be analysed with the next frame survey in Caprivi as the mesh size used determines the fish species, sizes caught and fishing pressure. Availability of data on the actual nets used will help to explain the sizes of fishes presented for sale at the fish market at Katima Mulilo Open Market. The high frequency of small tilapia recorded on the market is ascribed to the selective use of smaller mesh [70-80mm mesh nets] in the fishery [Van der Waal *et al* 2010]. This selective fishing for immature tilapia has been shown to have a negative impact on the tilapia population structure and recruitment [Van der Waal and Hay 2009].

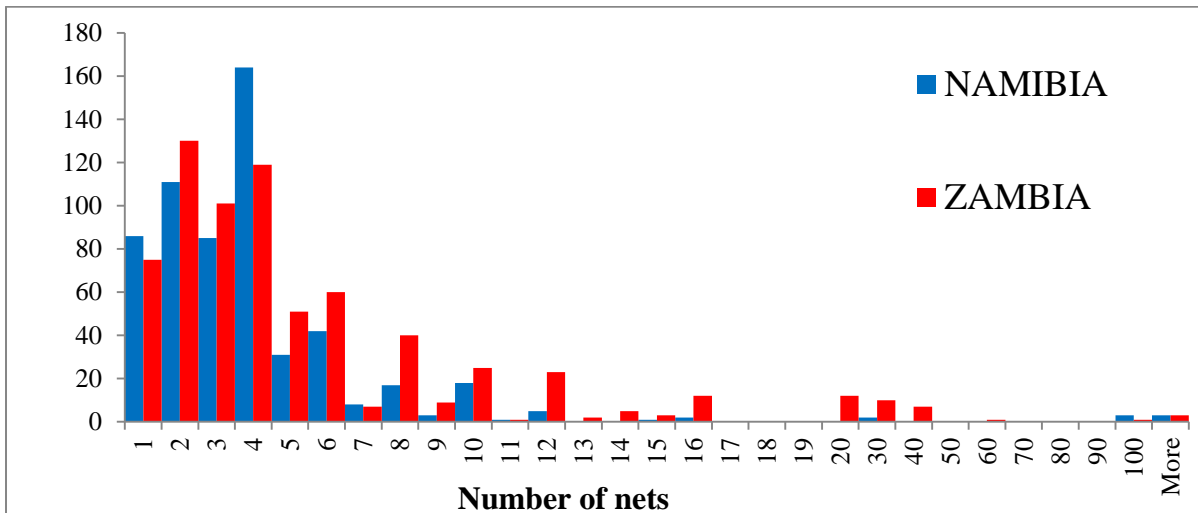


Figure 3.4.2 Distribution of number of nets owned by fishers in Namibia and Zambia.

Number of years fishing gear have been used by fishers

On the question of how many years gillnets have been used, the mean value for all fishers was 7.35 years.

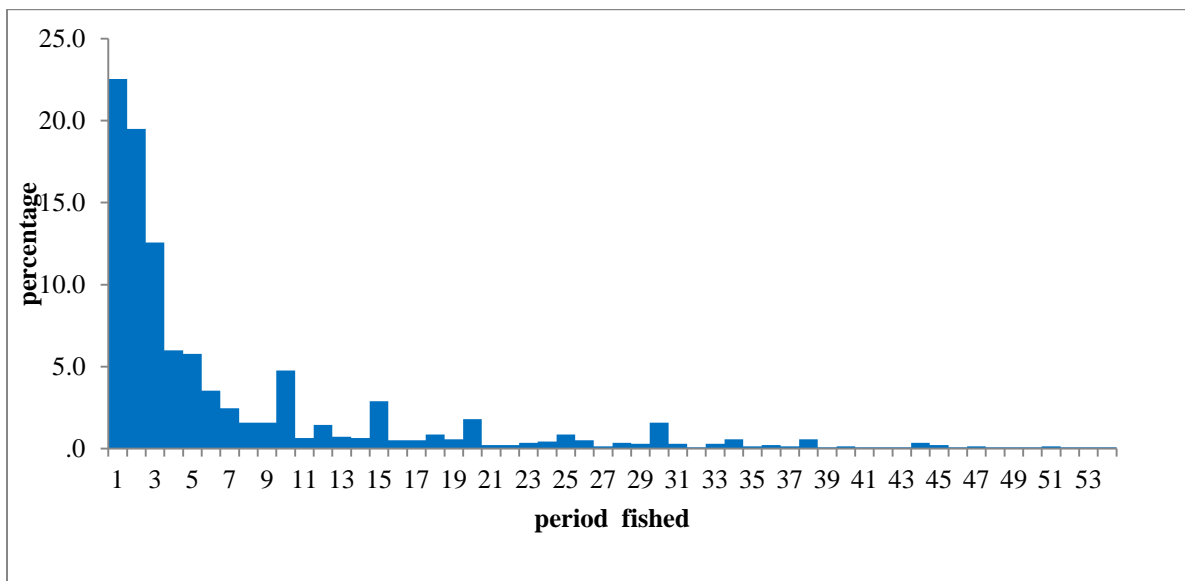


Figure 3.4.3 Frequency of number of years gill nets have been used by fishers

The number of years gillnets have been used indicates a large number of fishermen starting to use gill nets very recently, less than 7 years ago [Figure 3.4.3]. This coincides with the recent higher recruitment rate of fishers [see Section 3.3]. The slope of the frequency histogram also indicates that this increase in use of gillnets is still on the increase with many recent entrants. It is also revealing that some fishermen started using gill nets up to 61 years ago, in 1950. This must have been before nylon gillnets became available in the 1960's. By 1973 [35 years ago] nylon gillnets were already widely in use in Lake Liambezi and some other localities in Caprivi [Van der Waal 1981].

The picture for dragnetting is very different from that of gillnets.

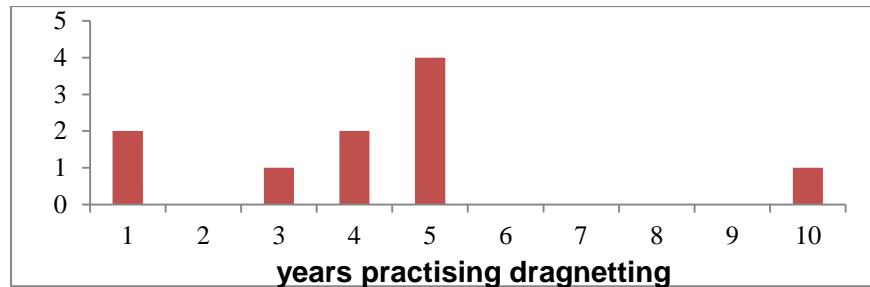


Figure 3.4.4 Number of years fishers have been taking part in dragnetting

Figure 3.4.4 shows that dragnetting in the Zambezi flood plains is not a common traditional fishing technique and its frequency started mainly 5 years before the frame survey [2003].

The number of years other gear were used was similarly not indicated by many respondents and the number of years they have been used may be an underestimate, depending on the period fishermen were actively fishing. It seems however that whereas dragnetting is a recent practice, bashing has been used as method to drive fish in set nets for a long time. Similarly, fishing with hooks and line is an old practice. The general conclusion is reached that the more artisanal fishers included in the survey do generally not use the traditional gear anymore.

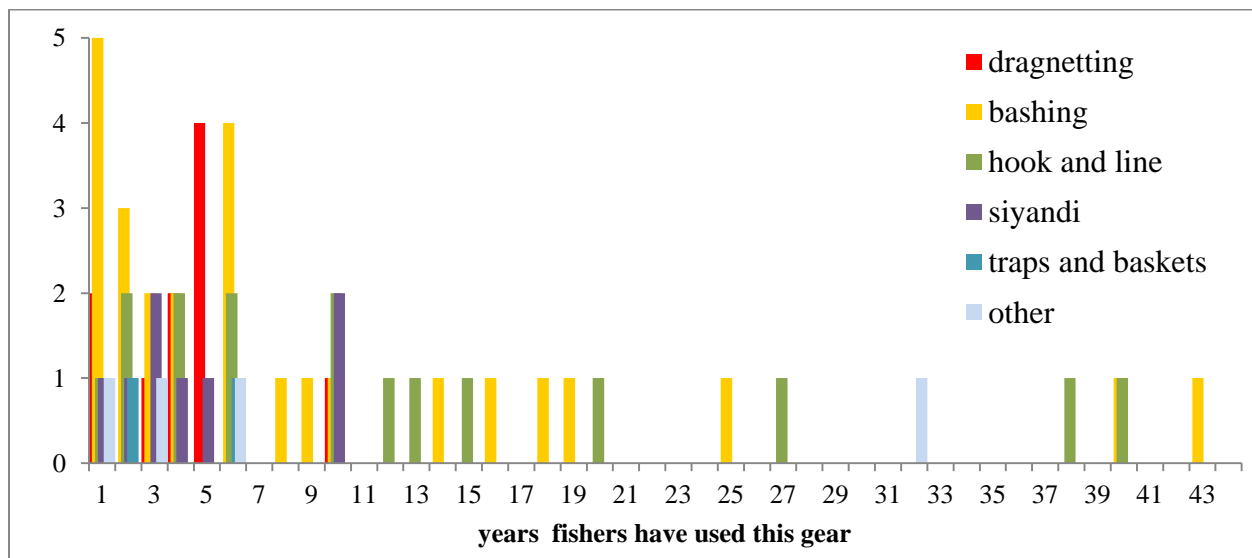


Figure 3.4.5 Number of years other fishing gear or fishing methods have been in use by fishers.

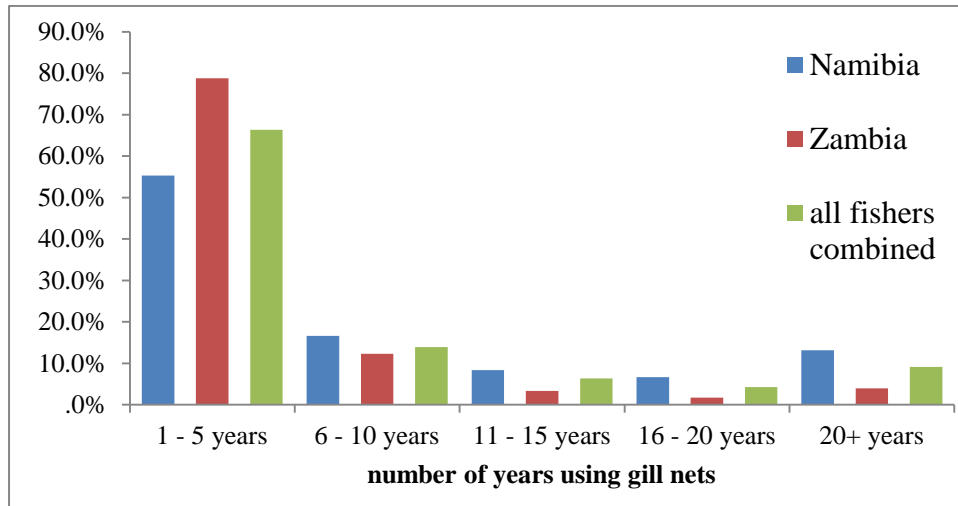


Figure 3.4.6 Comparison between number of years gill nets were reported to be used in Namibia and Zambia

The data on number of years nets were in use were analysed for Namibia and Zambia separately. There is a higher frequency in the low number of years gill nets are in use in Zambia than in Namibia but both show a similar high incidence in lower year numbers, supporting the finding that there is a recent increase in the use of gill nets.

3.5 FISHING LICENSES -- POSSESSION AND ACCEPTANCE

Possession of a fishing license

Special attention was given to the possession of the prescribed fishing licenses in Zambia and Namibia. After making contact with fishers about their fishing activities, they had no hesitation to reveal their status or position and were willing to reply to questions. When asked if the respondent possesses a fishing license, only 16.4 % Namibians indicated to have a valid license in Namibia but an almost double percentage of 29.5% Zambians in Zambia. Namibians fishing in Zambia and vice versa possess even less valid licenses. This situation reflects the low level of law enforcement in especially Namibia where some remote villages have not a single fisher possessing a fishing license. It may also reflect the difficulty to obtain fishing licenses in Namibia as fishing licenses were only available at the office of the Regional Council in Katima Mulilo or since 2008 also the offices of constituencies [Kabbe is the nearest centre for fishers in the Zambezi/Chobe floodplain]. **Table 3.5.1** summarises collected data for fishers in the two countries by citizenship. This is visually demonstrated in **Figure 3.5.1** and **2**.

Table 3.5.1 Recorded percentage of fishing license holding by citizenship of fishers on the Namibian and Zambian side of the Zambezi River,

Country	Citizenship	No fishing license	Non valid fishing license	Valid fishing license
Namibia	Namibians	79.0%	2.3%	16.4%
	Zambians	79.7%	6.2%	11.3%
	Other	50.0%	.0%	25.0%
Zambia	Zambians	62.7%	4.1%	29.5%
	Namibians	78.3%	.0%	21.7%
	Other	.0%	.0%	100.0%
not stated	Namibians	95.3%	.0%	4.7%
	Zambians	74.6%	5.9%	19.5%
	Other	100.0%	.0%	.0%

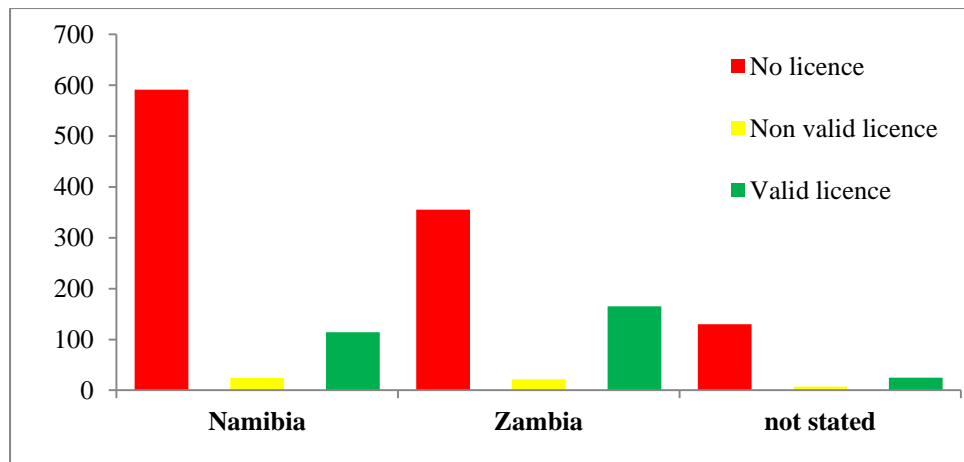


Figure 3.5.1 Possession of fishing licenses in Namibia and Zambia expressed as recorded numbers

An increase in the percentage of fishers possessing fishing licenses with increase of age was expected and data analysed for trends with increasing age. In Namibia there is a steady trend in increased possession of fishing license between 10 and 65 years that is not so clear in Zambia and only followed till 50 years [Figure 3.5.2] The percentage of fishers with valid fishing licenses increased in Zambia from a low 10% to a value around 30% for fishers between 25 and 50 years.

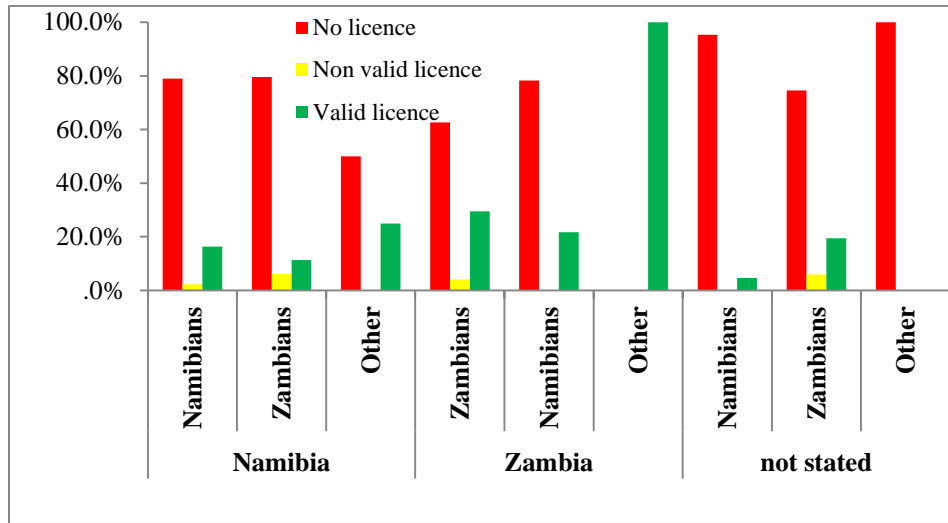


Figure 3.5.2 Percentage possession of fishing licenses by Namibian and Zambian citizens in the two countries

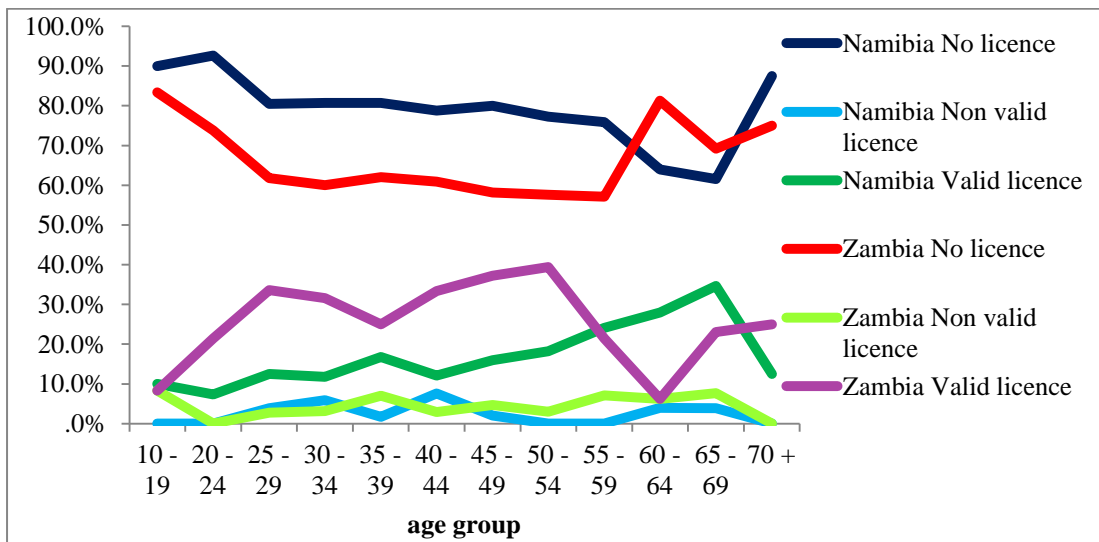


Figure 3.5.3 Change with age in the possession of fishing licenses in Namibia and Zambia

Ownership of nets

The ownership of the nets used, was explored and results summarized in **Figure 3.5.4**. More than 86 percent of the fishers own the nets they use but the percentage of owners in Zambia was 91 percent against 82 in Namibia. The number of non-owners in Zambia was also only half that in Namibia, where the number of nets borrowed or hired was double that in Zambia [**Figure 3.5.4**].

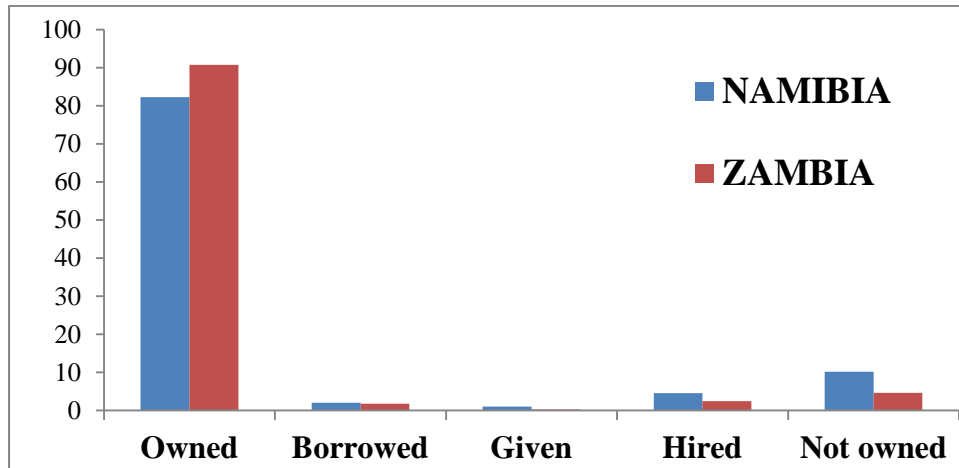


Figure 3.5.4 Ownership of gill nets in Namibia and Zambia as percentages

Possession of fishing licenses by net owners and non-net owners

It could be argued that owners of nets will be more conscious to obtain fishing licenses than persons just using nets of others. More persons in Namibia than in Zambia seem to use nets and fishing gear that is **not** owned by themselves [Figure 3.5.4 and Table 3.5.2]. This indicates that the practice to hire others to undertake fishing is more common in Caprivi and contributes further to the low fraction of fishers having fishing licenses. Discussions with discussion groups in Namibia indicated that most hired persons are Zambians coming across the river to work for Namibians. Often cattle guarding and fishing is combined by these persons.

Table 3.5.2 Distribution of fishing licenses amongst fishers owning and not owning the nets used.

Country	Owner of fishing nets	No license	Total	%with no license
Namibia	No	109	159	68.6
	Yes	482	589	81.8
total		591	748	79.0
Zambia	No	24	33	72.7
	Yes	331	529	62.6
total		355	562	63.2
Riverside Not Stated	No	18	20	90.0
	Yes	112	143	78.3
Total		130	163	79.8

Table 3.5.2 and **Figure 3.5.5** summarise the position of license versus net ownership. In Namibia fewer fishers possessing the fishing nets used, had a fishing license than those who had borrowed or were fishing for someone else. In Zambia the trend is opposite with more fishers owning nets also having a fishing license. The reason for this difference may be the ease to obtain a fishing license in Zambia compared to Namibia as well as the more affordable price of fishing licences.

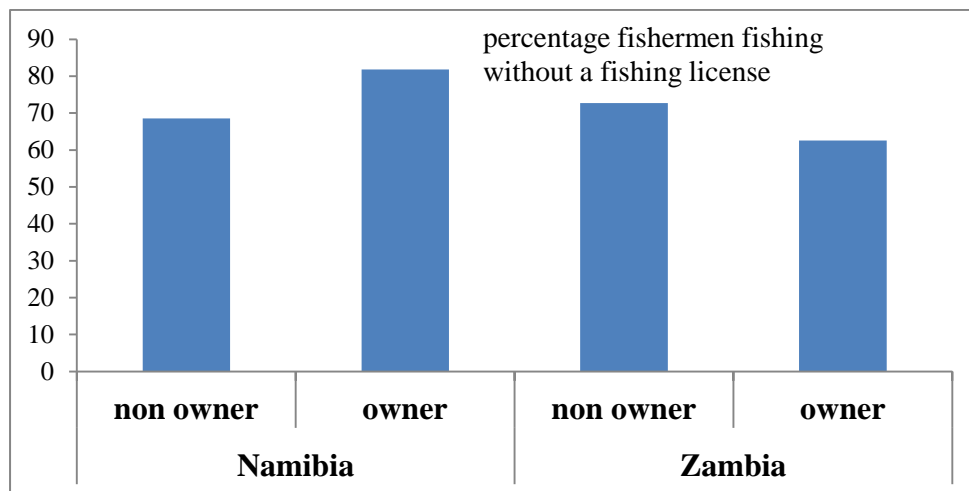


Figure 3.5.5 Percentage fishing net owners and non-owners fishing without a valid fishing license.

3.6 FISHING ACTIVITIES BY FISHERS

Frequency of fishing activities

The fishers were asked how much time they spend on fishing and how important fishing is to them. The results are summarised in **Table 3.6.1** and **Figure 3.6.1**. Nearly 60 % of the fishers indicate that they fish fulltime while a further 30% fish part-time, that is at least a quarter of the year. The rest fishes seasonal [mainly in winter] with only a very low number [1.4%] fishing occasionally. The breakdown of the possible differences with age groups in Namibia and Zambia is presented in **Table 3.6.2**.

Table 3.6.1 Percentage distribution of fishers in terms of time spent fishing. Fulltime = six to 12 months fishing; part-time = fishing and having other activities like cattle and fields; seasonal= fishing only a particular [winter]season; occasional = fishing where possible while herding.

Status of fisher	Number recorded	Percent
fulltime	860	58.4
part-time	431	29.3
seasonal	128	8.7
occasional	20	1.4
other	2	.1
No Response	32	2.2
Total	1473	100.0

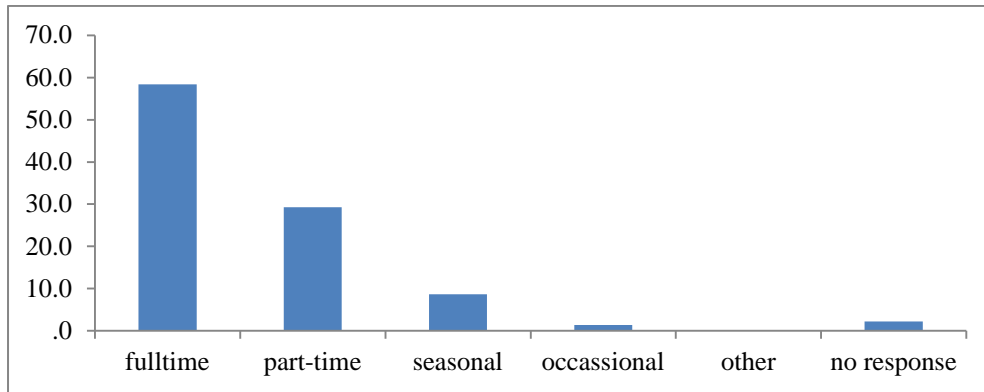


Figure 3.6.1 Percentage of fishers fishing fulltime or otherwise

In **Figure 3.6.2** the citizens in Namibia and Zambia are summarized according to the status of their fishing.

Figure 3.6.2 indicates that fulltime fishing was more common in Zambia and that Zambians in Namibia fished almost as often full-time as part-time. The category occasional fishers is almost absent in Zambia. This supports the observation that many hired Zambians found in Namibia are cattle herders fishing part-time to get some protein and gather some cash whilst working for Namibians.

There is no clear-cut trend visible from the age groups but some differences do exist between the fishers of Namibia and Zambia. These data are summarized in **Figure 3.6.3**.

The general trend between age groups for full-time and other fishers is similar in both countries but in Zambia more men are full-time fishers than in Namibia. There is a slight increase in the percentage fulltime fishers from 20 to 45 years in both countries, accompanied by a drop in part-time fishers. This reflects other job opportunities or occupation for younger men.

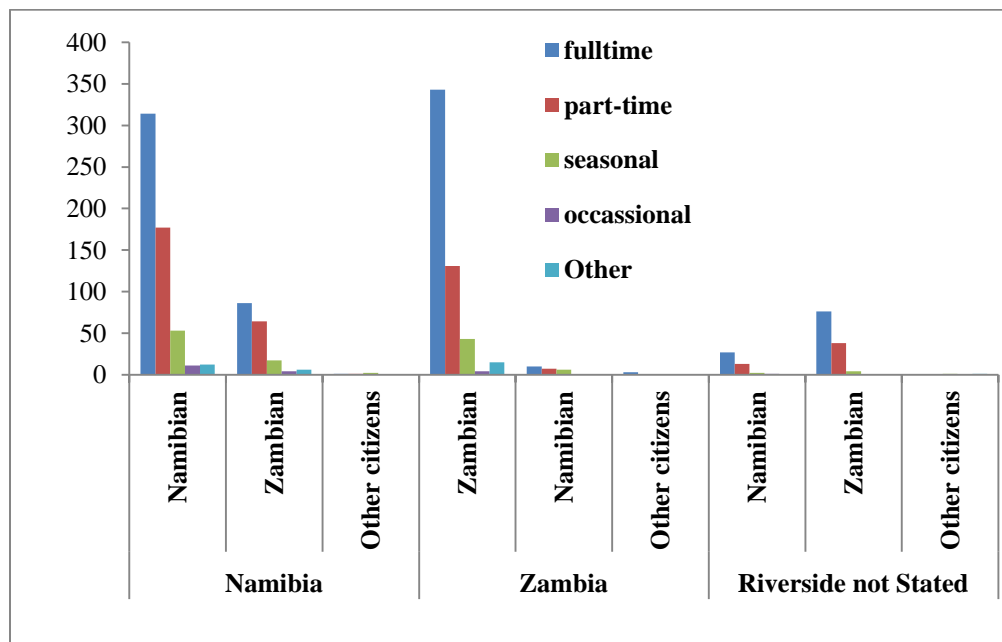


Figure 3.6.2 Full-time and other fishing by Namibian and Zambian citizens in Namibia and Zambia

Table 3.6.2 Change in fishing priorities with changing age group in Namibia and Zambia

ZAMBIA						NAMIBIA					
Age group	Full-time	Part-time	Seasonal	Occasional	Other	Age group	Full-time	Part-time	Seasonal	Occasional	Other
10 - 19	50.0%	25.0%	.0%	25.0%	.0%	10 - 19	50.0%	35.0%	15.0%	.0%	.0%
20 - 24	45.2%	28.6%	21.4%	.0%	4.8%	20 - 24	47.1%	33.8%	14.7%	2.9%	1.5%
25 - 29	62.7%	30.9%	5.5%	.0%	.9%	25 - 29	50.0%	38.3%	9.4%	.8%	1.6%
30 - 34	65.3%	22.1%	8.4%	1.1%	3.2%	30 - 34	55.5%	32.8%	10.1%	.8%	.8%
35 - 39	68.0%	21.0%	6.0%	.0%	5.0%	35 - 39	59.7%	30.3%	6.7%	2.5%	.8%
40 - 44	73.9%	20.3%	5.8%	.0%	.0%	40 - 44	56.1%	31.8%	9.1%	1.5%	1.5%
45 - 49	67.4%	23.3%	9.3%	.0%	.0%	45 - 49	68.0%	16.0%	10.0%	4.0%	2.0%
50 - 54	48.5%	33.3%	15.2%	.0%	3.0%	50 - 54	45.5%	31.8%	18.2%	.0%	4.5%
55 - 59	71.4%	7.1%	7.1%	.0%	14.3%	55 - 59	65.5%	24.1%	10.3%	.0%	.0%
60 - 64	37.5%	31.3%	25.0%	.0%	6.3%	60 - 64	52.0%	32.0%	8.0%	8.0%	.0%
65 - 69	76.9%	7.7%	15.4%	.0%	.0%	65 - 69	46.2%	42.3%	7.7%	.0%	3.8%
70 +	66.7%	33.3%	.0%	.0%	.0%	70 +	50.0%	33.3%	8.3%	8.3%	.0%

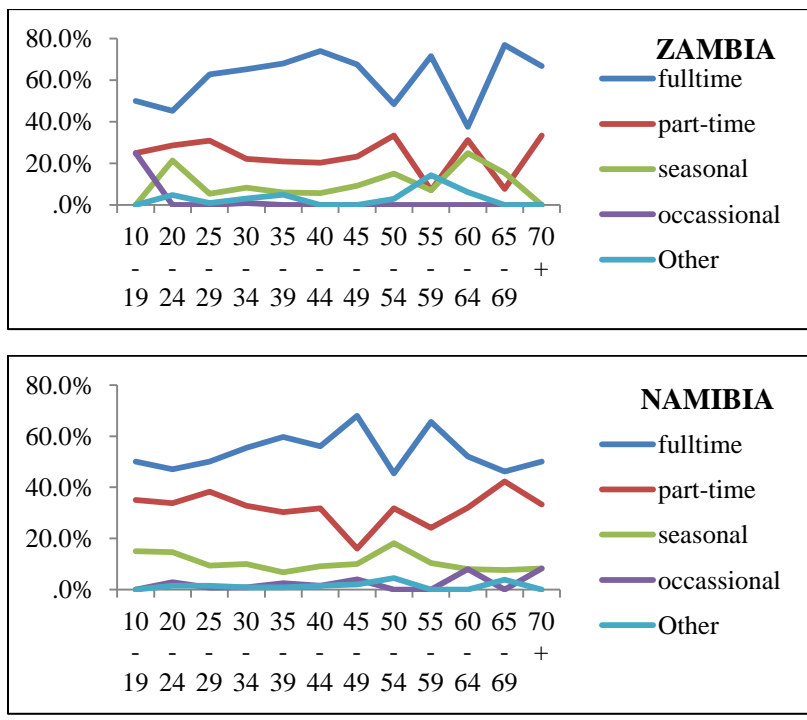


Figure 3.6.3 Change in the status of fishing in different age groups in Namibia and Zambia

Importance of fishing as source of income

When all fishers were asked what their source of main income is, fishing was listed on both sides of the river as the most important by more than 70% [Table 3.6.3 and Figure 3.6.4]. Other important sources were income from crops and cattle.

Table 3.6.3 Perceived main source of income of fishers in Namibia and Zambia

Main income	Namibia	Zambia	total
fishing	474	584	1058
crops	43	137	180
cattle	28	42	70
pension/ grants	35	5	40
remittances	6	1	7
government job	8	2	10
shop	7	6	13
other	25	41	66
Total	626	818	1444

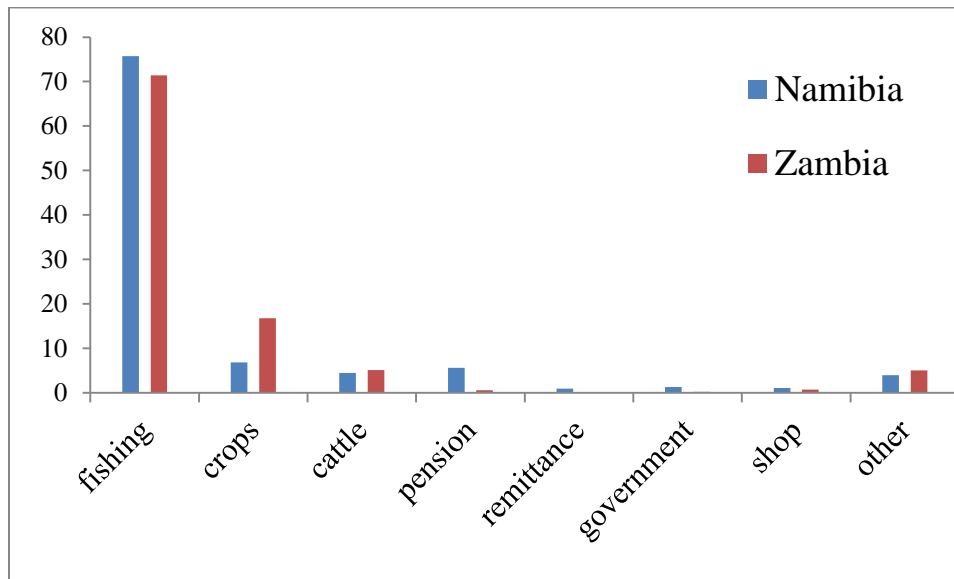


Figure 3.6.4 Percentage rating of activities as sources of income amongst fishers in Namibia and Zambia

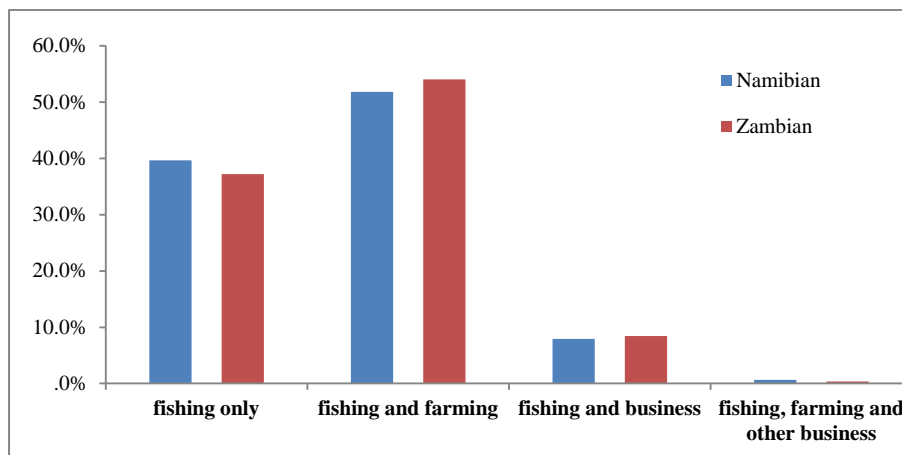


Figure 3.6.5 Rating of alternative income activities by fishers in Namibia and Zambia

When asked what other sources of income fishers have apart from fishing, most indicated that crops were the most important income generator after fish [Table 3.6.4 and Figure 3.6.5 and 3.5.6], followed by lower frequencies of pension grants, income from a shop or cattle. There is a difference between the two sides of the river, with a higher importance of cattle in Namibia and higher importance of crops in Zambia. The biggest difference lies in the near absence of pension income in Zambia, not a response to low numbers of aged fishers but reflecting a weak social support system in Zambia. Very few fishers in both countries held a government job. That does however not mean that some government officials do not do part-time fishing as well. In fact, some officials were met who had relatives and other people fishing for them on their behalf. Some actually supplied fishers with canoes, nets and licenses to fish for them. This situation may be common and may not have been adequately reflected quantitatively in this frame survey. The low scores of cattle as source of income is felt to be an underrepresentation as most Basubia living on the floodplains keep cattle.

Table 3.6.4 Importance of alternative sources of income for fishers in Namibia and Zambia

Other sources of income in household	Namibia	Zambia	Riverside Stated	Not	Total
Cattle	8.6%	6.0%	17.2%		8.6%
Crops	27.7%	44.8%	44.8%		36.1%
Government job	0.7%	0.2%	0.6%		0.5%
Grants	1.9%	0.2%	1.2%		1.2%
Pension	8.6%	0.4%	3.7%		4.9%
Remittances	1.2%	0.0%	1.8%		0.8%
Shop	5.3%	5.7%	3.1%		5.2%
Other	36.1%	37.2%	21.5%		34.9%
No Response	10.0%	5.5%	6.1%		7.9%

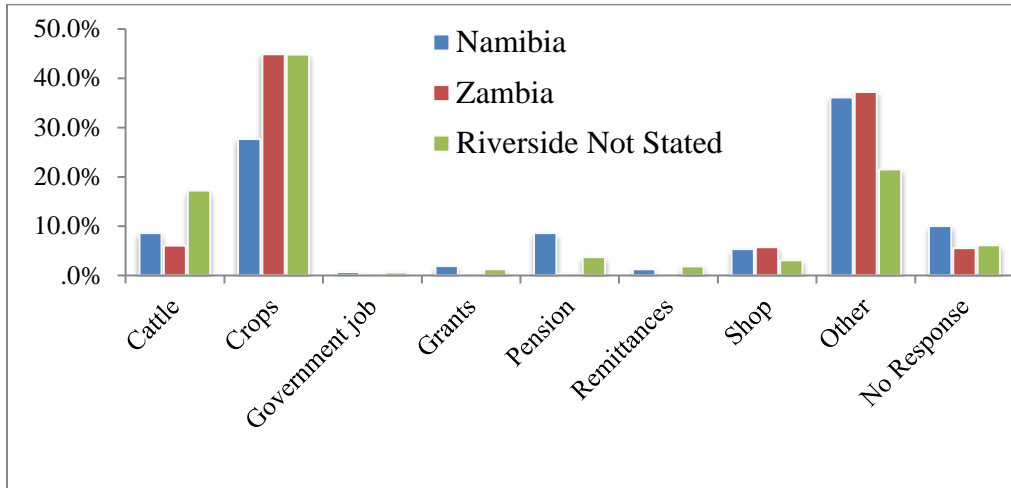


Figure 3.6.6 Importance of other sources of income after fishing amongst fishers on the Zambezi

Permission to fish in an area

A question was included asking if fishers need to obtain consent before fishing in their preferred spot. **Figure 3.6.7** summarizes the response and also indicates who would have to be asked permission from.

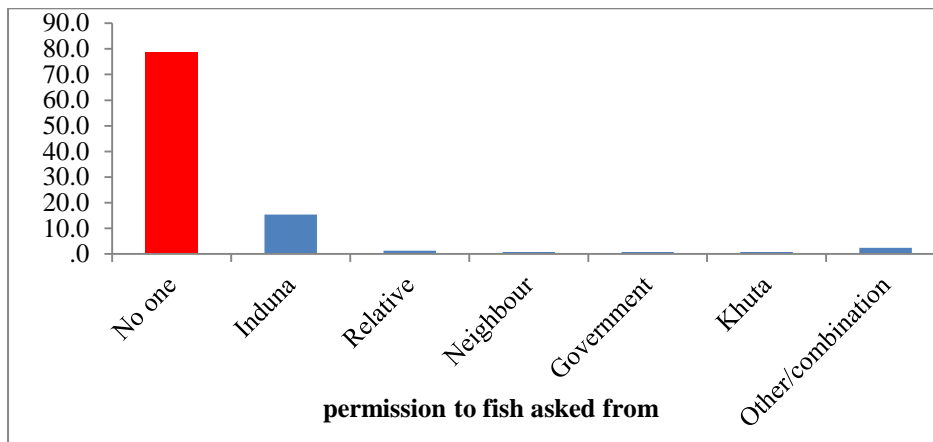


Figure 3.6.7 Permission to fish and who permission has to be obtained from, of all fishers questioned as percentage of response.

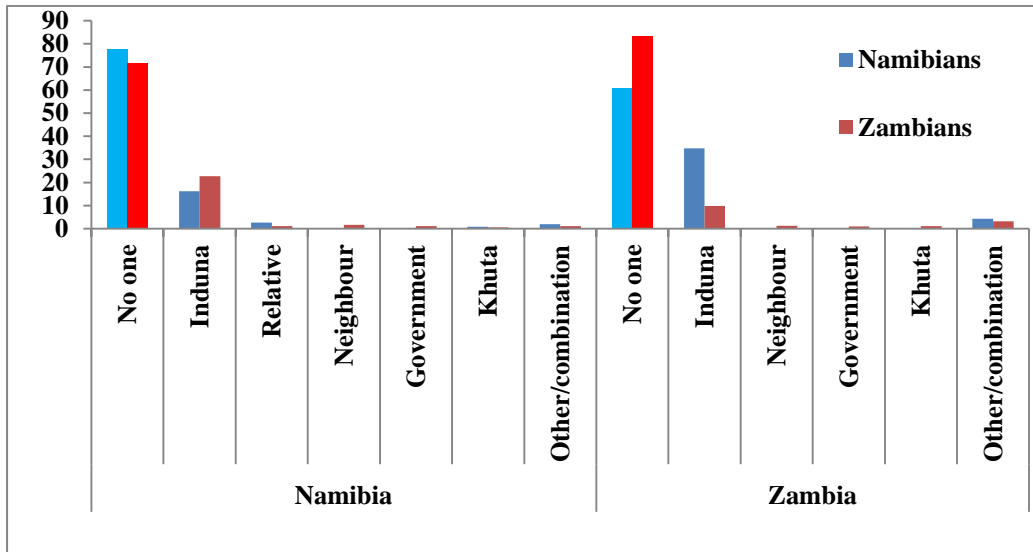


Figure 3.6.8 Permission to fish in Namibia and Zambia, expressed as percentage.

In general, the majority of fishermen [78%] do not regard permission required from any authorities to fish as important. The fishermen in Namibia ask more permission to fish [Figure 3.6.8], especially from the local headman, indicating a better operating traditional structure than in Zambia. It is also evident that Zambians fishing in Namibia or vice versa ask more permission than the local counterparts. This implies that fishing by non-citizens can potentially be controlled to some extent by existing structures – especially traditional authorities.

Figure 3.6.9 shows that there is no great difference between permission required to fish in the different fishing habitats on the Zambezi River. This is in contrast with the often quoted statement that milapo and backwaters are owned and permission is required to fish there. The percentage of free access in the main river and backwaters is however higher than for the other water types.

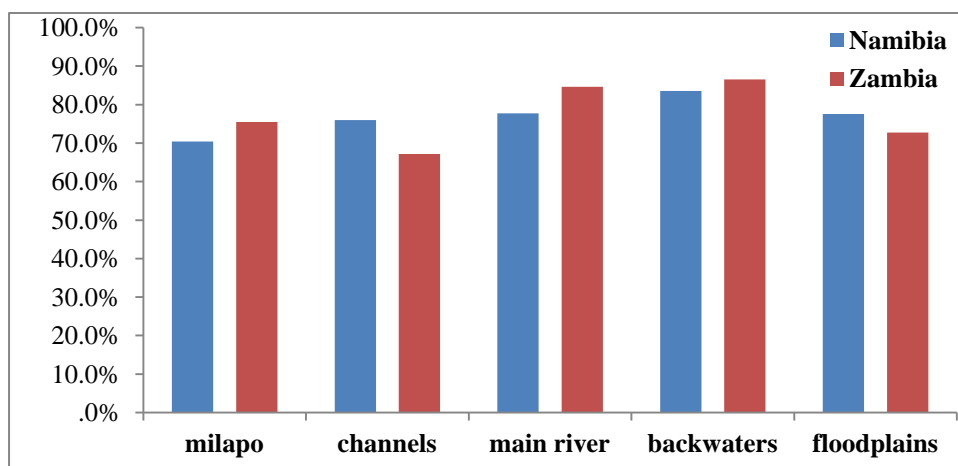


Figure 3.6.9 Percentage of fishers not asking permission to fish in the main fishing habitats.

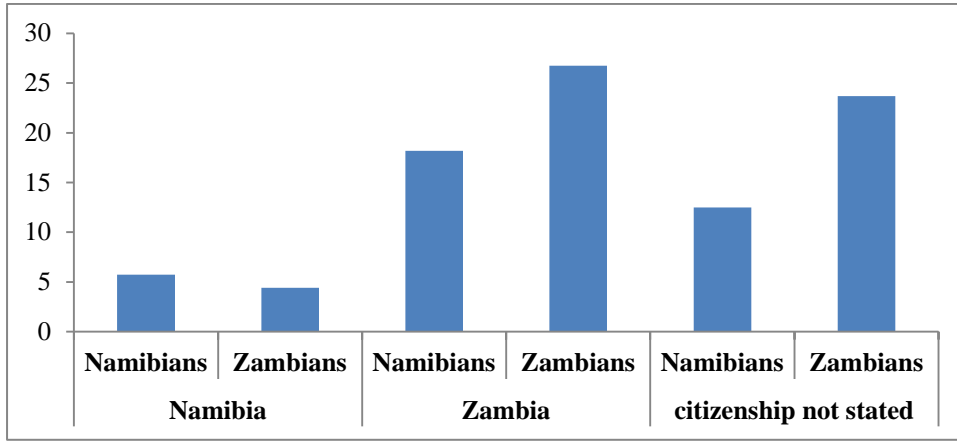


Figure 3.6.10 Percentage of fishers paying for permission to fish in Namibia and Zambia

When fishers were asked directly if they had to pay for the rights to fish in waters, the response was higher than would be expected from previous information [Figure 3.6.10]. Payment for the right to fish was much more common in Zambia than in Namibia. Fishers in Zambia seem to pay more frequently to the local headmen than in Namibia.

3.7 USE AND CONTROL OF FISHING GROUNDS

Preference for fishing sites for gillnetting

Fishers were asked where they prefer to set gillnets and results are summarized in Figure 3.7.1. In general, fishers prefer to fish the main channels of the Zambezi with its channels, followed by milapo [mulapos]. There is however a difference between the selection by Namibian and Zambian fishers, as summarized in Figure 3.7.2. Zambians have a greater preference to fish in the main channel and backwaters.

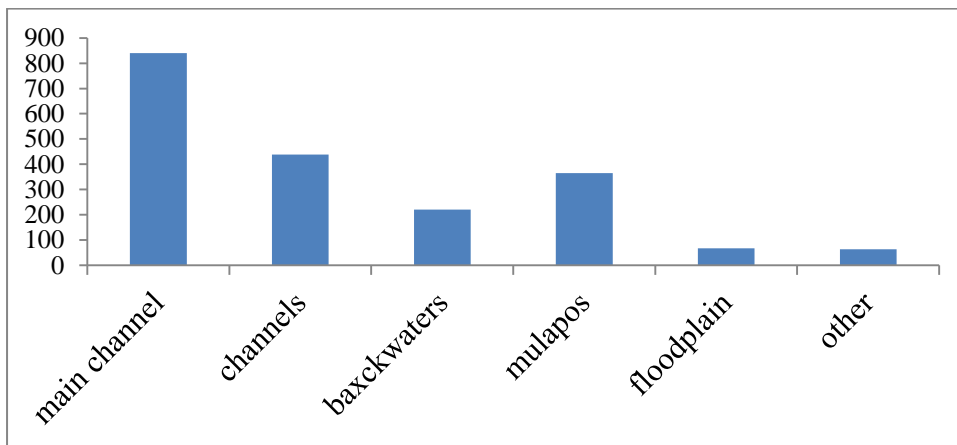


Figure 3.7.1 Preference for habitat types to set their gillnets by all fishers

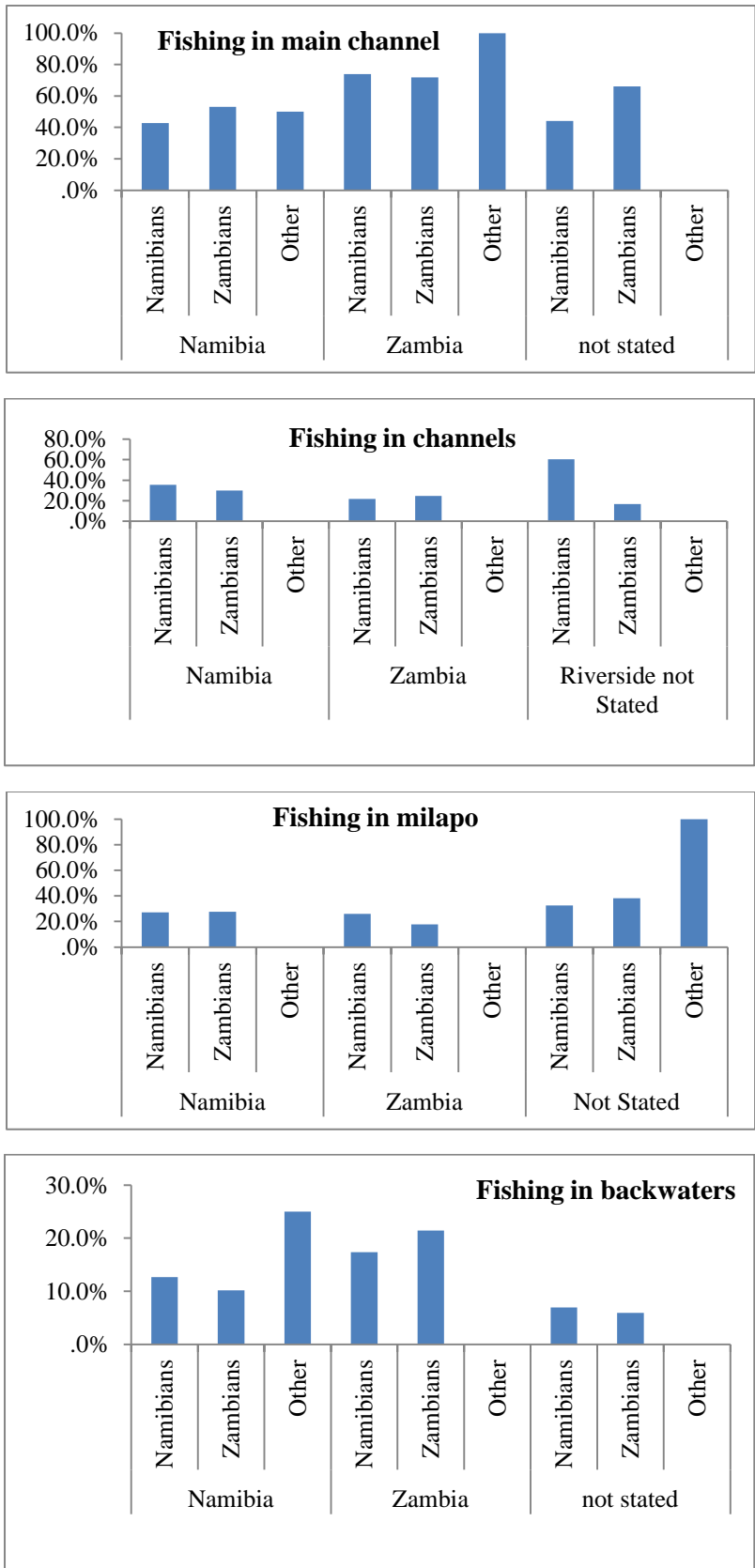


Figure 3.7.2 Fishing site preference of fishers in Namibia and Zambia

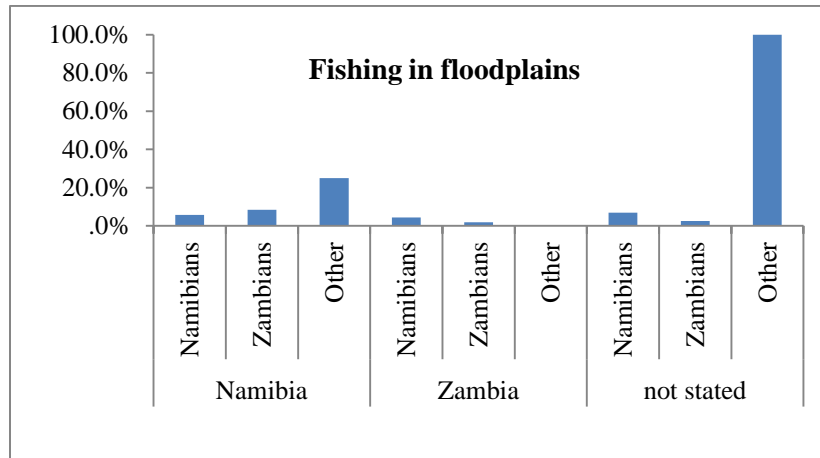


Figure 3.7.2. Continued

The most popular fishing grounds for gill nets appear to be the main channel of the river followed by channels and milapo. Backwaters and floodplains are not indicated as popular by the majority of fishers questioned. An analysis of change with age in choice for fishing grounds is presented in **Figure 3.7.3**. The preference for certain fishing habitats does not seem to change much between age groups in both Namibia and Zambia.

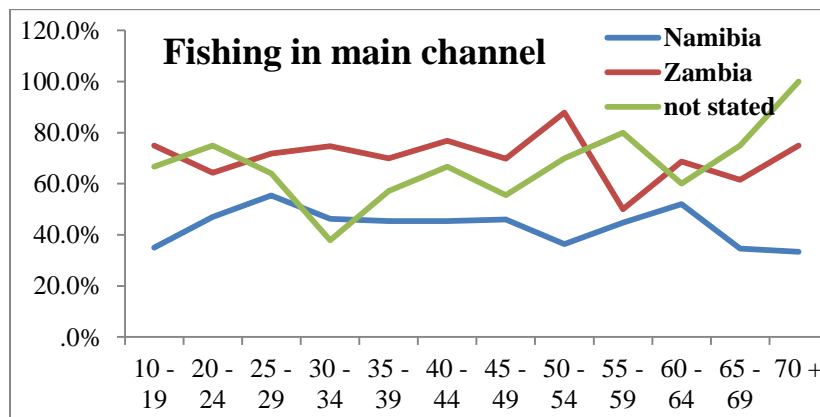
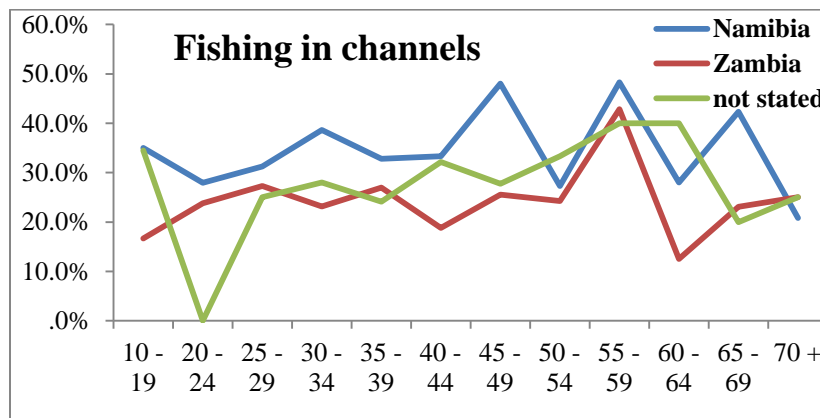


Figure 3.7.3 Change in preference to fish in certain habitats amongst age groups

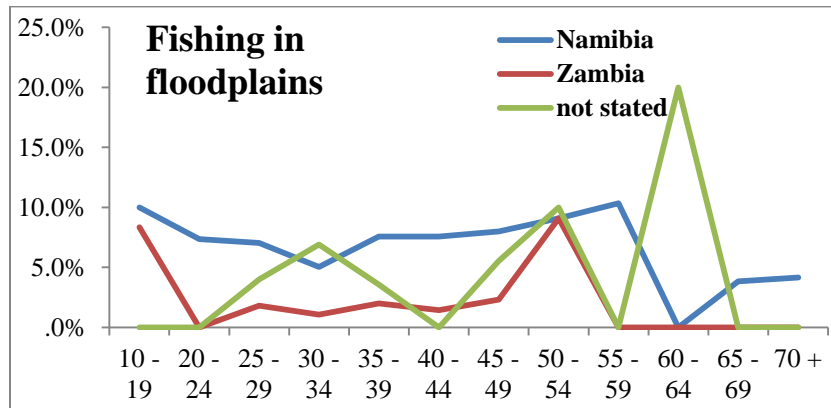
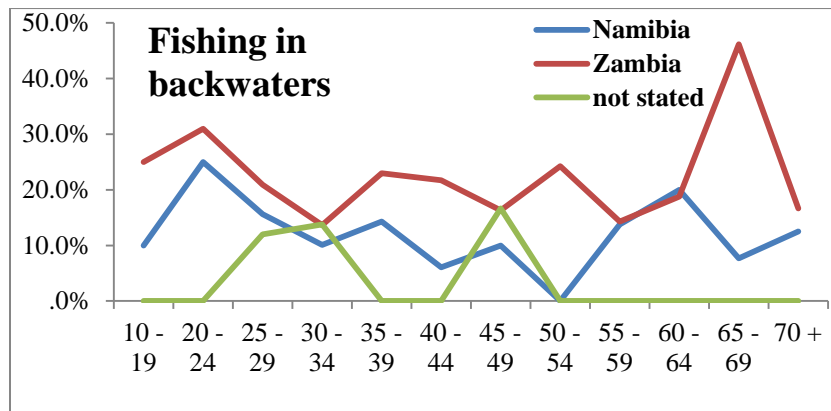
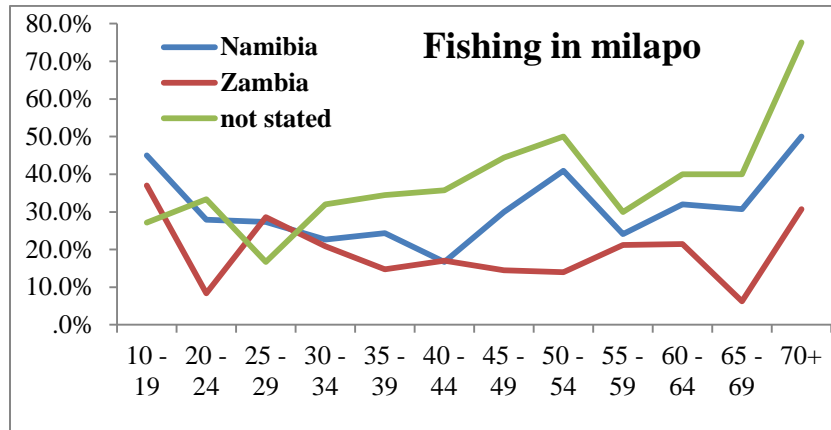


Figure 3.7.3. Continued

Tolerance to sharing fishing grounds

Willingness to share fishing grounds with other known and alien persons was asked and the response summarized in **Figure 3.7.4**. Direct family scored 60% tolerance in Namibia but was only 42% in Zambia.

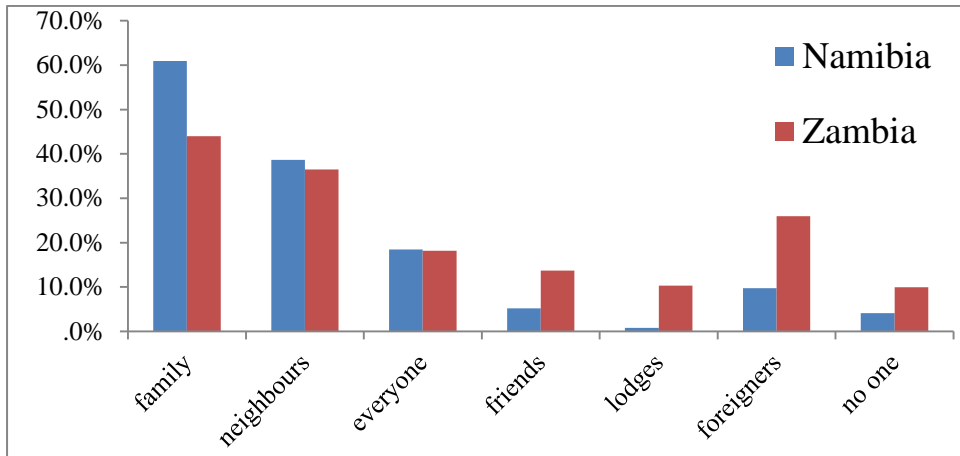


Figure 3.7.4 Recorded willingness to share fishing grounds with different fishing groups

As expected, the highest values to share are found with family members, followed by neighbours in the same village and low values for lodges and foreigners. There may be a difference in attitude amongst the fishers in Zambia who seem to be willing to share more with foreigners, friends and lodges. This negative attitude in Namibia may be the result of the perception that Zambians fish regularly in foreign Namibian waters.

Perceptions on decline in fishing success

Fishers were asked for their comments on possible changes in the fishery they have experienced and their answers divided amongst five categories for Namibia and Zambia separately. **Figure 3.7.5** shows that about 30% of the fishers on both sides of the Zambezi regard the fishing positive, with no change. However, more than 60% consider the fishery to have declined or to be very low. It must be remembered that the 2007 and 2008 were both good flood years in which fishing is usually regarded as better.

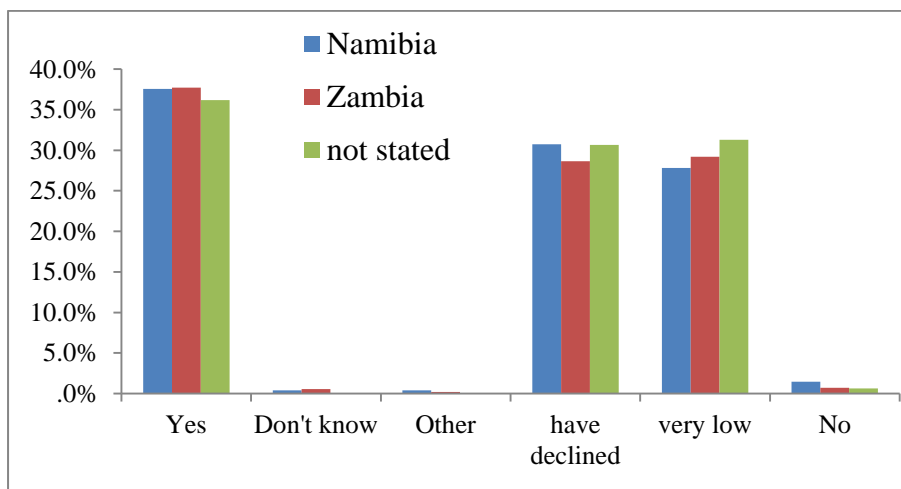


Figure 3.7.5 Summary of opinion of fishers on the statement that fishing is good.

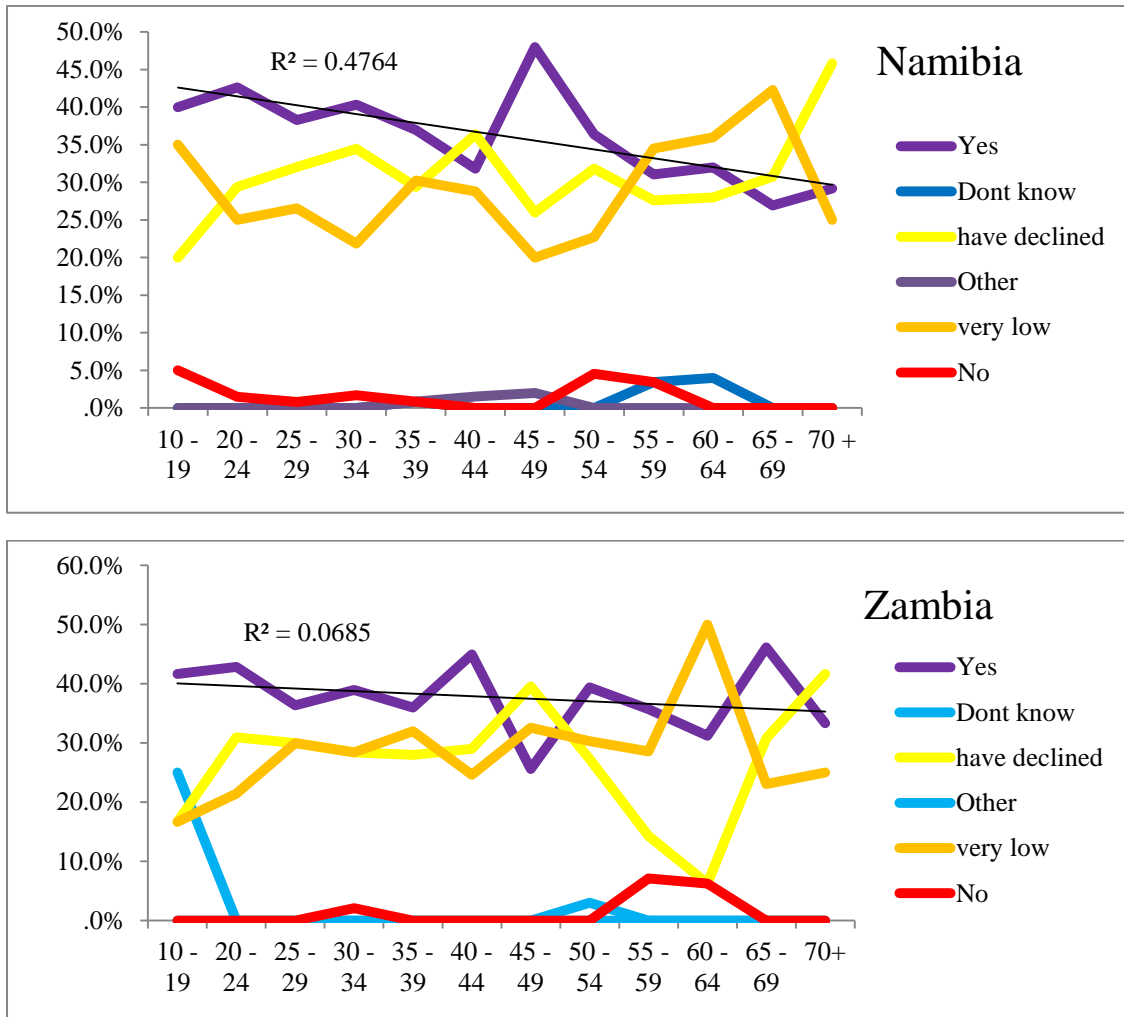


Figure 3.7.6 Change in perception between age groups in Namibia and Zambia of fishing success

Figure 3.7.6 demonstrates the perception between age groups on the present fishing success. There is a decrease in the proportion of older fishers in Namibia regarding fishing as good. The trend was more prominent in Namibia, possibly reflecting the experience of older fishers who can remember much better catches earlier.

Opinion on best and worst times of the year to fish

The fishers had mixed opinions on fishing success during the rainy and flood seasons but were more unanimous that the winter season [Maliha] was the best fishing season, but springtime was considered as the worst by most [asked in the positive and negative].

This information differs from earlier surveys where Maliha [May to July] was indicated as the best and Litabula [November to January] and Muunda [February to April] as the worst time to catch fish [Purvis 2002]. Comparison of frequencies by which different fishing seasons are ranked as best in Namibia and Zambia is summarised in **Table 3.7.1** and **Figure 3.7.8**. The reason for the preference of the flood season as preferred fishing season in Caprivi is not clear but may be linked to actual better catches at

certain selected channels draining floodwater away from the Zambezi towards the Chobe, where local fishers then make good catches in February [van der Waal, pers obs.]

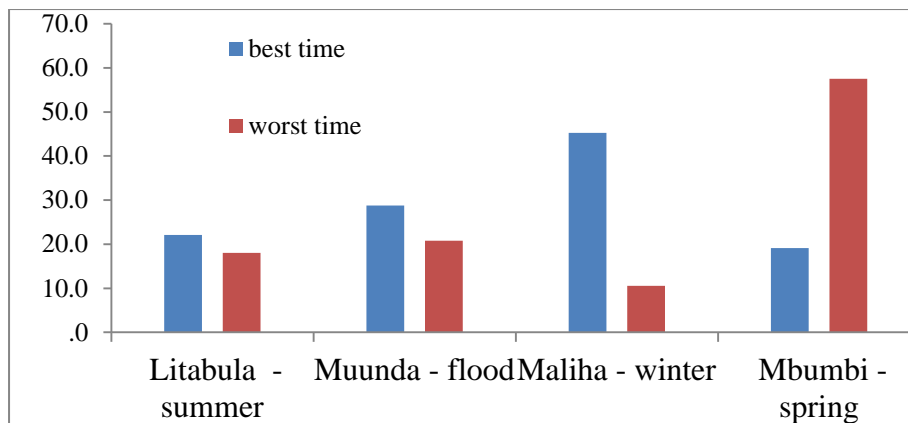


Figure 3.7.7 Summary of opinions on what are the best and worst times to fish

Table 3.7.1 Preference for seasons for fishing by fishers in Namibia and Zambia

	Namibia	Zambia	not stated
Litabula - summer	13.0%	31.0%	27.6%
Muunda - flood	40.9%	12.3%	20.9%
Maliha - winter	38.8%	54.1%	42.3%
Mbumbi - spring	17.8%	17.3%	22.7%

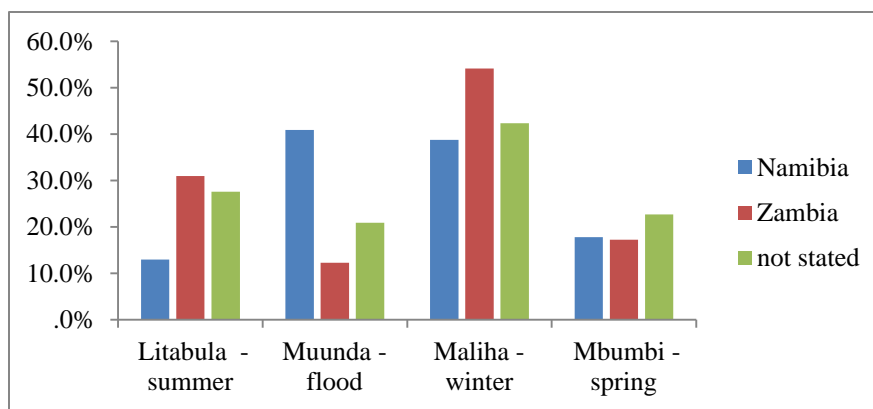


Figure 3.7.8 Preference of fishing seasons in Namibia and Zambia

3.8 ACCEPTANCE OF FISHERIES LEGISLATION AND REGULATIONS

Acceptance of the need for regulation

Fishers were asked if the fishery on the Zambezi flood plain should be controlled by fisheries legislation and regulations and the overwhelming majority was positive about regulation with 88% in favour.[Table 3.8.1, Figure 3.8.1].

Table 3.8.1 Acceptance of the need for fisheries regulation by different fisher groups.

country	Types of fisher	Opinion of fishers			
		Yes	Don't know	No	Total
Namibia	No Response	14	0	3	17
	fulltime	352	8	41	401
	part-time	225	2	15	242
	seasonal	56	0	16	72
	occasional	14	0	1	15
	Other	0	0	1	1
	Total	661	10	77	748
Zambia	No Response	14	0	0	14
	fulltime	312	11	33	356
	part-time	114	4	20	138
	seasonal	45	0	4	49
	occasional	4	0	0	4
	Other	1	0	0	1
	Total	490	15	57	562
Riverside Not Stated	No Response	1		0	1
	fulltime	95		8	103
	part-time	48		3	51
	seasonal	7		0	7
	occasional	1		0	1
	Total	152		11	163

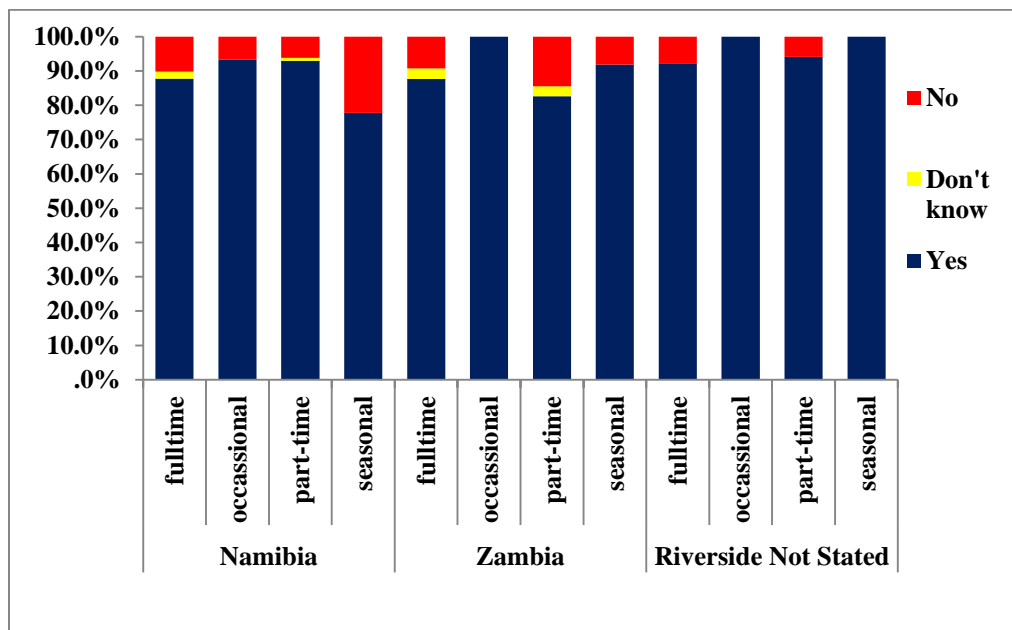


Figure 3.8.1 Acceptance for the need to regulate the fishery with regulations expressed a percentage of each fishing group

Most fishers in both countries accept the need for some sort of effective fisheries regulations. The percentage of acceptance was generally more than 90%; only seasonal fishers in Namibia were about 80% motivated. No clear difference between the fishers groups [from fulltime to occasional] was evident.

Then the question was asked **who** should undertake such regulation of the fishery. The results per country are presented in **Figure 3.8.2**. Fishers could indicate a combination of whoever they thought were suitable to control the fishing activities.

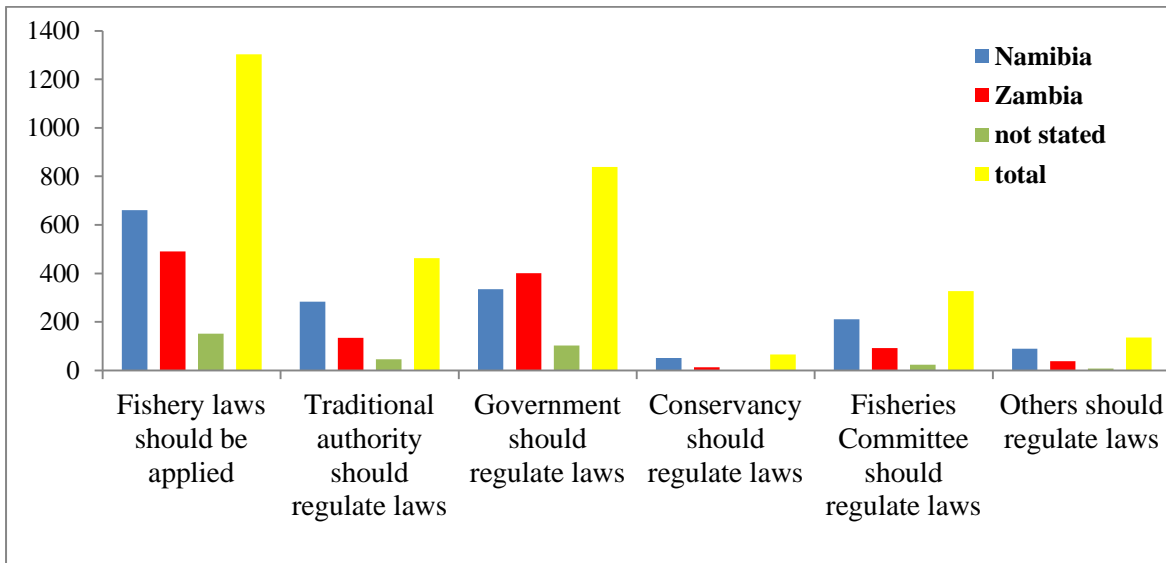


Figure 3.8.2 Number of fishers in favour of the regulation of the fisheries and by whom this should be undertaken in Namibia and Zambia

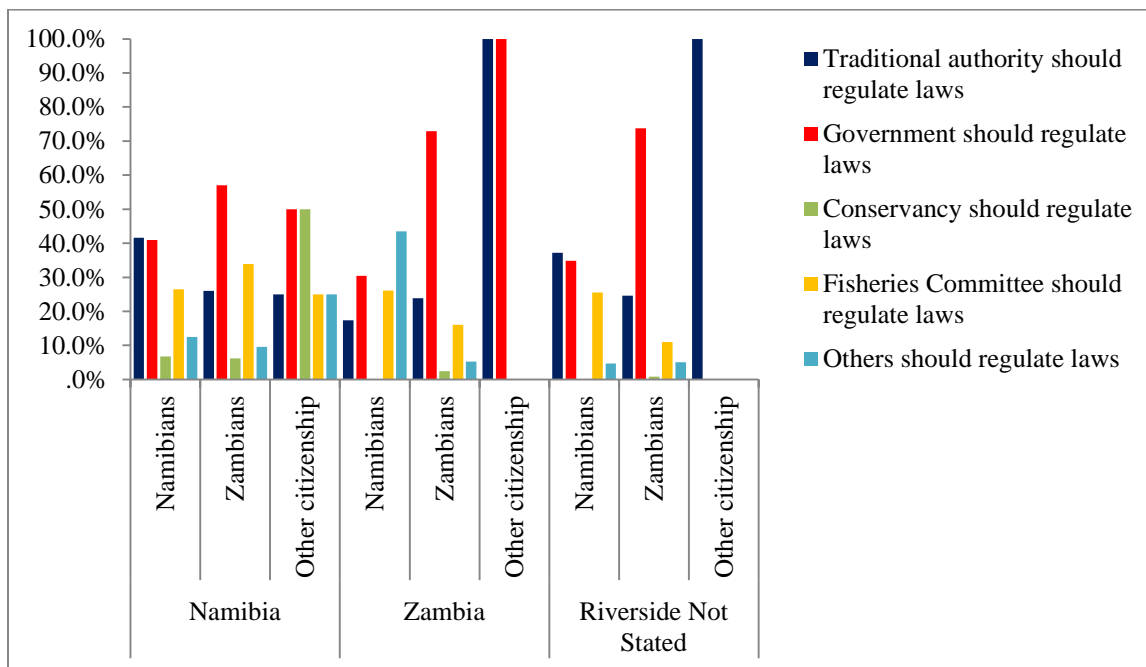


Figure 3.8.3 Opinions of Namibian and Zambian fishers in the two countries about the application of fisheries regulations.

The majority of fishermen in both Namibia and Zambia are in favour of regulation by the government, followed by the local traditional authority and a local fisheries committee. Very few were in favour of conservancies taking control, possibly reflecting a lack of knowledge of what conservancies are and what they could achieve and also their experience of the present situation where conservancies are not [allowed to] regulating fisheries resources. Fishers in Zambia seem to be more in favour of government control and nearly the same number of fishers in Namibia supported traditional control as much as government control. One of the reasons for higher support for government control in Zambia

is the much longer history of fisheries control in Zambia compared to Namibia where fisheries legislation regulation was only promulgated in 2003 and management and regulation in 2006.

Figure 3.8.3 shows that the Namibians in Namibia are more in favour of traditional control than Namibians in Zambia. Zambians in both countries held the same opinion and were more in favour of government control. More fishers were in favour of conservancies controlling fisheries regulation in Namibia. This may be due to the fact that conservancies have been around in Namibia for ten years and although the concept of protecting fish resources through such conservancies is new, it seems to be readily accepted once understood. The high [$>70\%$] support for government management in Zambia is a reflection of the exposure to control of the fisheries by the Department of Fisheries, including a closed season since 2006.

Perceived purpose of fisheries regulations

Fishers were asked to supply reasons for having fisheries regulations and the results are summarized in **Figure 3.8.4**

Fishers indicated valid reasons such as “to conserve fish” and “protect fish breeding” more frequently than reasons such as “to keep other fishers out of their fishing grounds”. The replies could be grouped easily and are very similar for both sides of the river.

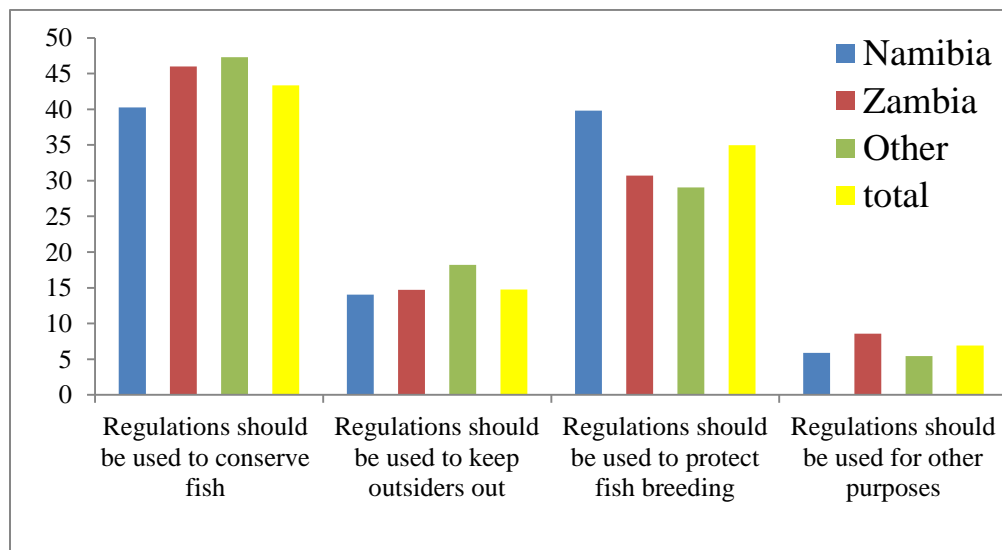


Figure 3.8.4 Opinions of fishers about the reasons why fisheries regulations are necessary expressed as percentage

A further question was asked about the most important component of such fisheries legislation. Fishers could choose more than one option and **Figure 3.8.5** presents the percentage of the first option selected by fishers in Namibia, Zambia, country unknown and total. Most fishers in Zambia regard a closed fishing season as the most important tool, followed by banning the use of small mesh gill nets. In Namibia the closed fishing season and small mesh nets scored similarly but forbidding dragnetting was listed equally important as a tool to conserve fish life through fisheries regulations. What is very clear is that both the licensing of nets and the creation of fisheries reserves score low as first option to conserve the fish resource amongst the fishers.

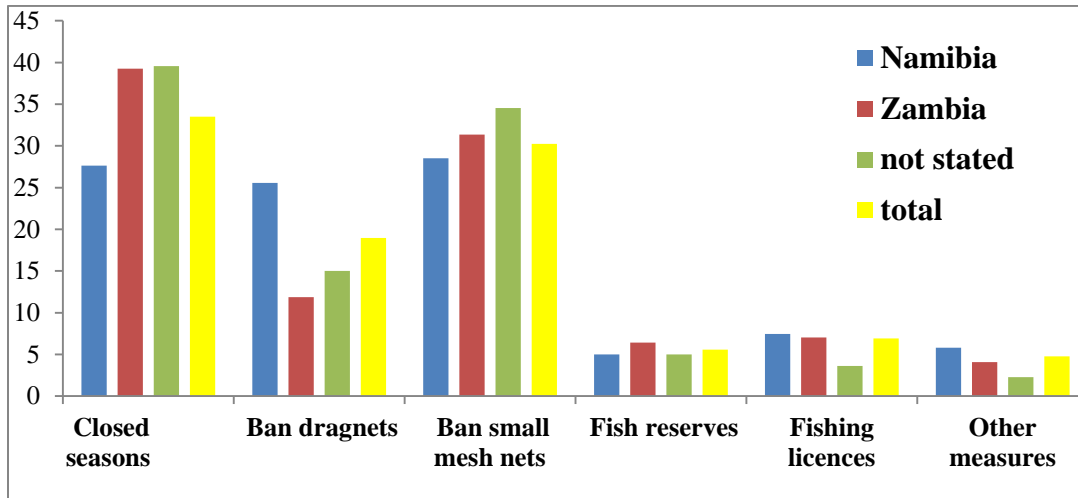


Figure 3.8.5 Perceptions on which regulatory tools should be used to protect fisheries resources, expressed as percentages.

Acceptance of fishing licenses and fishing fees and their purpose

Fishers were asked if they were prepared to pay for the right to catch fish with nets. They were also asked what the funds generated by the license fees, should be used for. The results of the questionnaires are summarized in Figure 3.8.6.

Namibians and Zambians both accept the need to pay for fishing rights and the acceptance is somewhat higher in Zambia [where license fees are also lower] than in Namibia. Only a low fraction of respondents indicated that they will not or even never pay for fishing licenses but a larger group [around 10%] indicated that they could not pay as there was no cash available.

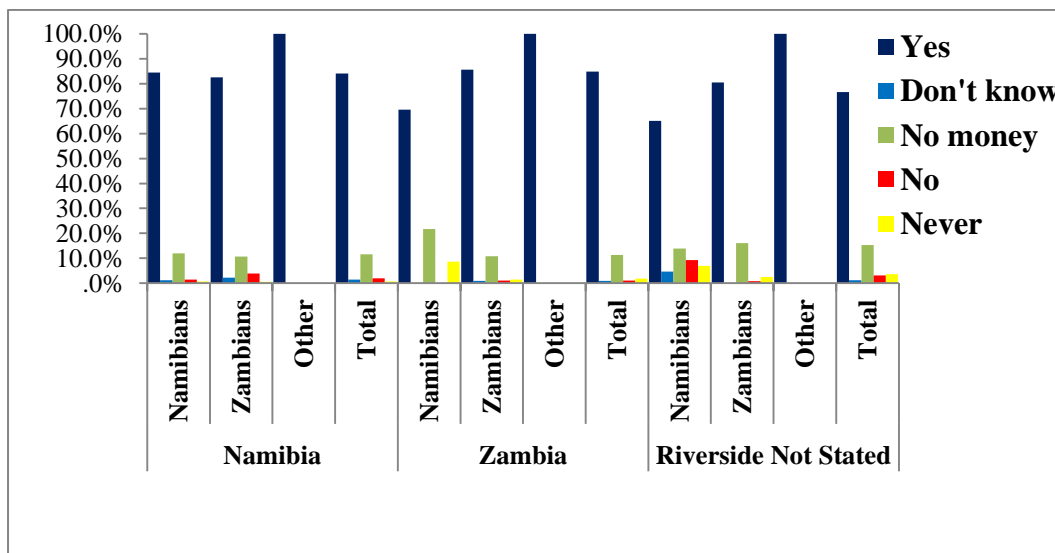


Figure 3.8.6 Acceptance of the need for payment for fishing licenses by citizens in Namibia and Zambia

Fishers were asked how the funds generated from fishing licenses should be spent. Fishers indicated that payment of government [Fisheries Department], indunas and traditional authority institutions and the community itself, are thought to be the main purpose of funds in Namibia. In Zambia payment of fisheries guards was placed first, followed by people in the community and other uses. Support of the local induna and traditional authority did not score high in Zambia. The development of a conservancy was placed at a low priority on both sides.

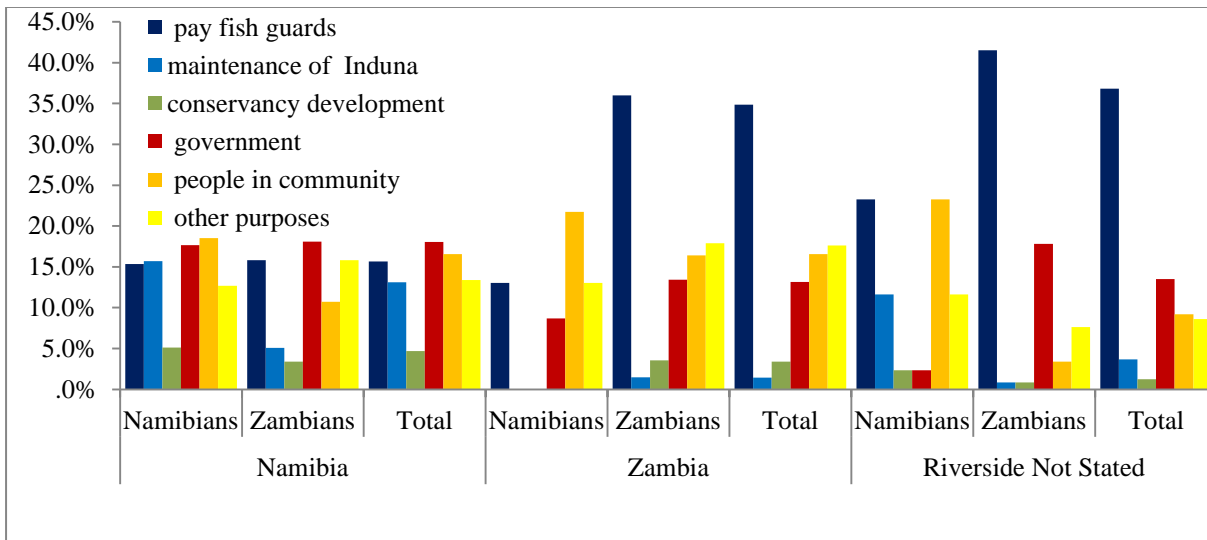


Figure 3.8.7 Opinion of fishers in Namibia and Zambia on the purpose and use of funds generated from fishing license fees

3.9 KNOWLEDGE OF FISHERS ON THE FISH DISEASE EPIZOOTIC ULCERATIVE SYNDROME [EUS]

The opportunity to test the knowledge of fishers on the new reportable fish disease EUS that was observed in the Zambezi in Caprivi for the first time in Africa in 2006, was used by asking questions on their knowledge of this disease.

The results of questions about knowledge of fishers is presented in Table 3.9.1 and Figure 3.9.1.

Table 3.9.1 Knowledge of fishers of EUS fish disease

Country	No	Never seen it	Not even heard of it	Other opinion	Yes, I know it	Total
Namibia	144	79	64	35	426	748
Zambia	95	22	14	5	426	562
Riverside not stated	23	20	7	2	111	163
Total	262	121	85	42	963	1473
Percentage	17.8%	8.2%	5.8%	2.9%	65.4%	

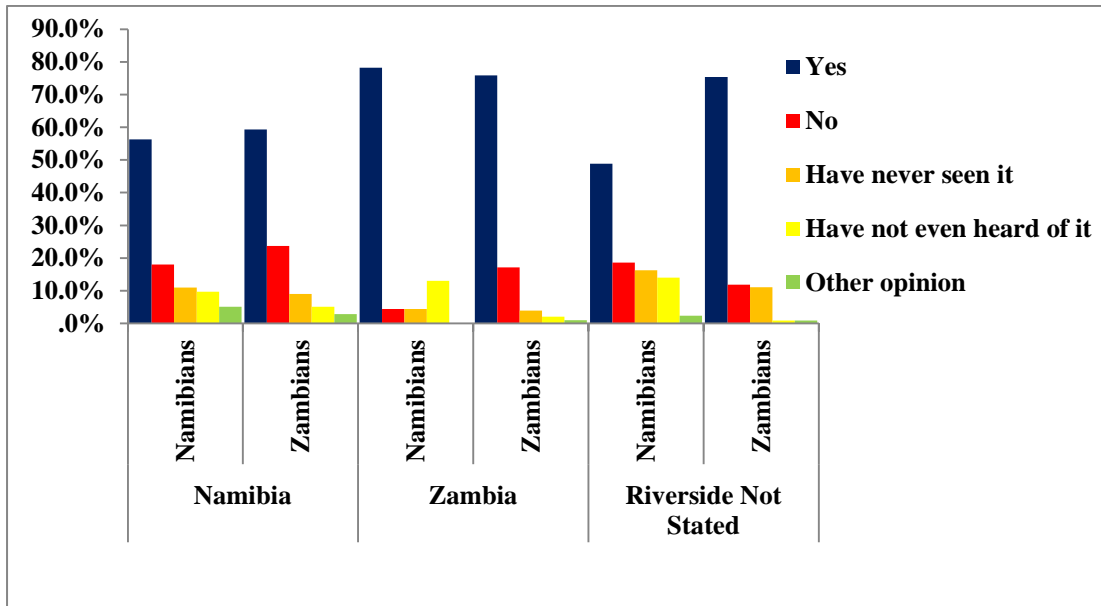


Figure 3.9.1 Awareness of fishers in Namibia and Zambia of EUS expressed as percentage per group

Questions were asked and photos of the typical sores caused by the EUS disease shown to fishers who then indicated their awareness on a scale from 'yes' to 'never heard of it'. 65% of the fishers indicated that they knew the disease but 24% indicated they knew nothing of the disease. There seems to be a higher awareness about the disease in Zambia than in Namibia. This is even reflected in the category where the river side is not known and may reflect the greater exposure given to the disease in the media [both newspapers and local radio] in Zambia.

4 DISCUSSION

The current survey included the Chobe River that was not done in 2002 (Abbott et al.2002) when a frame survey was conducted along the Zambezi River. This may explain some of the differences in results for Namibia between the two frame surveys.

The number of villages visited was much higher than when the survey was done in 2002 (Abbott et al. 2002) 78 villages compared to 575 villages. Another clear difference is that according to Abbott et al. 2002, 18 (25%) villages were surveyed in Namibia compared to 486 (85%) during this survey. It is not certain whether this is due to the sampling methodology (see earlier statement) or whether there are more fishing villages in Namibia compared to Zambia. Again proportionally, more temporary villages are present in Zambia that were not recorded in 2002. The way a temporary settlement was described could have played a role.

The average number of households per settlement is 9.2 in Namibia and 52.9 in Zambia. Both numbers are higher with a drastic increase in the number of household per settlement since 2002 when the average was 4 for Namibia and 17 for Zambia indicating a drastic increase in numbers of people into these areas. The average number of persons per household according to Mendelsohn and Roberts (1999) is 5.4, compared to the 5.2 per household for Namibian settlements during this survey.

The average number of dugout canoes per household decreased since 2002 from 1.3 boats per household in Namibia since 2002 to 0.48 presently and from 0.9 in Zambia to 0.43. It seems that the number of canoes did not increase at the same rate as the influx of people into the area. A new phenomenon is the presence of a number of engine powered boats on the river, indicating the commercialisation of the fish resource.

Very few females are engaged in gill net fishing activities. In 2002 only 0.7% of the fishers interviewed were females compared to 2.5% presently, a slight increase in females fishing with gill nets. It seems that presently the majority of fishers are between the ages of 30 and 40 years compared to between 20 and 30 years in 2002.

The number of nets owned by fishermen declined in Namibia since 2002 from 9.3 nets per fisher to 3.8, but increased slightly in Zambia from 5.6 to 6.7. It must be taken into account that the number of nets allowed in Namibia according to legislation (legislation was not in place in 2002) per fishermen is 4. This may have influenced the number of gill nets in Namibia.

The distribution of languages spoken did not change significantly since 2002 with the majority of people in Namibia speaking Subia, followed by Lozi. In Zambia the majority speaks Lozi. The other languages are actually insignificant in the region compared to Subia and Lozi.

There is a tendency that the percentage of full time fishers increased since 2002 from 26% in Namibia and 39% in Zambia to the present where 58% (combined Namibia and Zambia) stated that their only income was from fishing. This also indicates an increase in effort over the last number of years.

The same opinion exist from the majority of the people as was recorded in 2002 (80%) that no permission is needed to fish. Those that did indicate that permission is needed identified mainly the indunas as the responsible authority from whom permission was needed.

The fishermen in Namibia were evenly in favour of the Government and the Traditional Authority implementing legislation and in Zambia the preference lies with the Government.

Namibians are still of the opinion that banning small mesh nets are the best way to protect the resource with the Zambians in favour of a closed season. This perception did not change since 2002.

5 CONCLUSION

It is clear that the number of households per village increased since 2002 and that more people are now residing along the river. It also seems that the emphasis of the fishery is changing from being a subsistence fishery to a more commercialised fishery. This is evident from the presence of engine powered boats. Also not seen during the survey in 2008, but presently (2010), the use of monofilament gill nets is becoming prominent in the area. The percentage fulltime fishermen is on the increase (nearly doubled since 2002) which may indicate that the demand for fish is on the increase and that the current return on investment is making it a more lucrative business opportunity in the area. The high recent recruitment of fishers in both countries supports the attractiveness of fishing as livelihood. The importance of fishing is enhanced by the fact that 85% of the fishermen are heading their households, adding pressure provide for the families, even if this means changing from subsistence to a more commercialised fishery. This further allows for illegal fishing methods to ensure enough daily protein and cash for the family to sustain their livelihood.

Currently fishing grounds are still perceived as open access with the majority of the people fishing without seeing the need to request permission. Despite this, fishermen are of the opinion that the fish are on the decline and that some type of management of the resource is needed. Government and the Traditional Authority are the two institutions identified to take the lead in this. The idea of banning small mesh sizes to stop the decline of the fish resource is still perceived as the best management tool for Namibians followed by closed seasons and the banning of dragnets. The issue of fish protected areas was a new concept at the time of the frame survey and probably not well understood. This however seems to be changing now (2010) with more communities showing interest in establishing fish protected areas.

Fishermen are not against the paying and issuing of fishing licenses, the only concern currently is the decentralisation of the issuing authority. Amendment of legislation is underway to facilitate the issuing of licenses, as the current system is totally ineffective with only 16% of Namibian fishermen having valid gill net licenses.

There is a clear trend that more Zambians are fishing in Namibia than Namibians fishing in Zambia. This corresponds with the information received from many fishers complaining about conflicts with Zambian fishermen entering their fishing grounds. A further contributing factor fuelling conflict is that it is perceived that permission is not needed by fishermen to fish in any water body.

Open access to fishing grounds and the lack of effective patrols are the two main contributing factors leading to the current pressure on the resource. Despite the fact that a large percentage of the fishermen are noticing a decline in fish stocks, they are still unwilling to change to sustainable ways of fishing, mainly due to the two factors mentioned.

The age of the different villages in Zambia and Namibia show that fishing played an important role in the area for many years. This was mainly for subsistence, but recent changes indicate that this is changing, which may present a major threat to the resource for future generations. The impression exists that everyone is taking out as much as they can before the total collapse of the fish stocks.

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7. APPENDIX 1 QUESTIONNAIRE USED FOR FRAME SURVEY

ZAMBEZI/CHOBE RIVER FISHERIES FRAME SURVEY 2008

By Department of Fisheries, Zambia and Ministry of Fisheries and Marine Resources, Namibia and the Zambezi/Chobe Fisheries Project

ZAMBEZI/CHOBE RIVER FISHERIES FRAME SURVEY 2008

By Department of Fisheries, Zambia and Ministry of Fisheries and Marine Resources, Namibia and the Zambezi/Chobe Fisheries Project

FORM A: VILLAGE/FISHING CAMP CHARACTERISTICS

CONFIDENTIAL

Nam Zam Name of Recorder: _____ Date: _____ Time: _____

Name of area : _____ Name of Village/ camp: _____

Age of Village: ____ Population size: ____ Number of households: ____

GPS:S: _____ E: _____

Induna ya munzi: _____ Silalo induna: _____

NUMBER OF FISHING BOATS BY TYPE:

- | | | |
|-----------------------------|----------------------|----------------------------|
| 1. Canoes | <input type="text"/> | |
| 2. Fiberglass/plastic boats | <input type="text"/> | |
| 3. Engine powered boats | <input type="text"/> | |
| 4. Other boats | <input type="text"/> | Total <input type="text"/> |

Number of fishers at camp/village by type:

- | | | |
|-----------------------------------|----------------------|----------------------------|
| 5. Boat and net owners | <input type="text"/> | |
| 6. Net owners | <input type="text"/> | |
| 7. Boat owners | <input type="text"/> | |
| 8. Other fishers [traps, baskets] | <input type="text"/> | Total <input type="text"/> |

Is this village/camp it occupied permanently? Yes No

How many months a year is the camp occupied? months

If this camp is temporary, what is your home village? _____

What agricultural activity takes place here?.

None Maize Millet Sorghum Vegetables
Pumpkin Beans Cassava Sweet potato
Others Describe _____

Where are these activities? Dry upland wet floodplain

NOTES: (such as condition of village, behaviour of people interviewed)

FORM B: FISHER CHARACTERISTICS

CONFIDENTIAL

Recorder: _____ Date: _____ Village(s): _____

<i>Fisher Code</i>	A g e	Gen der	Citizen ship	Language group	Marital Status	Your position in household	How many dependents	Other sources of income of household	Which income is most important?	Years Fished	Years living In this village/ camp	How do you dispose of your fish?	What do you do apart from fishing?
meaning: 1= letter of river system Z, C, F, L, K 2-3=letter abbreviation of area 4=number of enumerator 5-6=number of fisherman			Country N = Namibia, Z = Zambia, B = Botswana Or O = other	1. Lozi 2. Subia 3. Fwe 4. Tonga 5. Tokaleya 6. Totela 7. Bemba 8. Mbunda 9. Chokwe 10. Mbukushu 11. Other	1.Married 2.Single 3.Divorced 4.Widower 5. Other	Give number	1. Cattle 2. Crops 3. Govern- ment job 4. Remit tances 5. Pension 6. Grants 7. Shop/ trade 8. Piece work 9. Other	1. Fishing 2. Cattle 3. Crops 4. Govern- ment job 5. Remit tances 6. Pension 7. Grants 8. Shop/trade 9. piece work 10. Other	Give years	Give years	1. Family takes to market 2. Sell to people from village 3. Sell to vendors from town. – [KM] 4. Keep fish for eating. 5. Dry fish for later use. 6. Other	1. All I do is to fish 2. I fish and farm 3. I have other business as well 4. I have other income/ grants/ salary	

ZAMBEZI/CHOBE RIVER FISHERIES FRAME SURVEY 2008

By Department of Fisheries, Zambia and Ministry of Fisheries and Marine Resources, Namibia and the
Zambezi/Chobe Fisheries Project

CONFIDENTIAL

Recorder: _____ Date: _____ Village(s): _____

FORM C: FISHING GEAR

Fisher code	Boat type & number		Gear type, number and use									
	Type	Number	Type	Number	Mesh size, inches	Length of net mounted, m	Twine thickness	Owner of gear?	Status in fishing employment	Number of years this type of gear is used?		
1= river system 2-3 = area 4= recorder 5-6 = number of fisher	1: Mukolo 2: Fiber/metal plank boat 3: Engine 4: Borrowed 5.:Other		1: Gill net 2: Drag net 3. Siyandi 4. Kashuto, hook 5: Bashing 6. Traps, baskets 7. Others		Stretched mesh in inches or hook size	Length of net used to fish in m. Do not give length as bought or on label	2, 3, 4, 6, 9, 12 or other ply	1. No 2. Yes 3. Hired 3.Borrowed 4. Given	1. Self employed 2. Hired 3. For family 4. Helping	Give number		

Zambezi/Chobe River Fisheries Frame Survey 2008

By Department of Fisheries, Zambia and Ministry of Fisheries and Marine Resources, Namibia and the
Zambezi/Chobe Fisheries Project

CONFIDENTIAL

Recorder: _____ . Date: _____ Village(s): _____

FORM

D : FISHING ACTIVITY

Fisher Code	Best time to fish	Worst time to fish	Fulltime, Seasonal, Parttime or Occasional fisher?	Where do you fish?	Do you fish with a valid license?	Who do you ask to fish?	Do you pay for fishing?	Who shares the areas you fish in?	Are catches good?
	1. Litabula - summer 2. Muunda - flood 3. Maliha - winter 4. Mbumbi - spring		1. Fulltime = 6+m/y 2. Seasonal = one season/y 3. Part-time = do other jobs as well 4. Occasional = once/y or for sport 5. Other	1. Mulapos 2. Channels 3. Main channel 4. Backwater 5. Flood plain 6. Other 7. All	1= No license 2= valid license 3= non valid license	1. Induna 2. Relatives 3. Neighbours 4. No one 5. Government. 6. Khuta 7. Other	Yes or no Indicate amount if yes	1. Family 2. Neighbours 3. Lodges 4. Friends 5. Foreigners 6. Every one 7. No one	1. Yes 2. Have declined 3. Very low 4. No 5. Don't know 6. Other

Zambezi/Chobe River Fisheries Frame Survey 2008

By Department of Fisheries, Zambia and Ministry of Fisheries and Marine Resources, Namibia and the
Zambezi/Chobe Fisheries Project

Recorder: _____ Date: _____ Village(s): _____

FORM E: PRESENT RESOURCE MANAGEMENT

Fisher Code	What type of fishing is banned here?	Who says it is banned?	What illegal fishing happens here?	By who?	What happens if they are caught?	Have there been conflicts here?	With who?	About What?	What do you know about fishery laws?
	1. Small meshes 2. Drag nets 3. Bashing 4. Lamp 5. Poison 6. Closed season 7. Other	1. Induna 2. Govt. 3. Khuta 4. Fishermen 5. Conservancy 6. All 7. Other	1. Small meshes 2. Drag nets 3. Bashing 4. Lamp 5. Poison 6. Closed season 7. None 8. Other	1. Fishers here. 2. Namibians 3. Zambians 4. Other	1. Fine 2. Take nets 3. Arrest 4. Warning 5. Nothing 6. Other	Yes or no	1. People here 2. Namibians 3. Zambians 4. Wildlife 5. Other	1. Fish without asking 2. Using banned methods 3. Too many nets 4. Wildlife 5. Other	1. Nothing 2. Little 3. Wants to know more 4. Knows well

Zambezi/Chobe River Fisheries Frame Survey 2008

By Department of Fisheries, Zambia and Ministry of Fisheries and Marine Resources, Namibia and the
Zambezi/Chobe Fisheries Project

Recorder: _____ Date: _____ Village(s): _____

FORM F: FUTURE RESOURCE MANAGEMENT/KNOWLEDGE OF EUS

Fisher code	Should the fishery be regulated?	If yes, by who?	What should the regulations be used for?	What is the most important way of making sure there is enough fish for everyone?	Are you prepared to pay for a fishing license?	How should such money be used?	Do you know the fish disease known as EUS? Have you seen it?
	1= Yes 2= Don't know 3= No 4= Other	1. Traditional Authority, Khuta 2. Government 3. Conservancy 4. Fisheries Committee 5. All 6. Other	1. Conserve fish 2. Keep outsiders out 3. Protect fish breeding 4. All 5. Other	1. Closed seasons 2. Ban dragnets 3. Ban small mesh nets 4. Fish reserves 5. Fishing licenses 6. Other	1. Yes 2. Don't know 3. No money 4. Never 5. Other	1. For fish guards 2. For induna 3. For conservancy 4. For government 5. For people 6. Don't know 7. Other	1. Yes 2. Have seen it here. 3. Have seen it at 4. Have never seen it. 5. Have not even heard of it. 6. Other

