Fish farming at Mwandi, Zambia

Abundant small fish species on Caprivi floodplain

Catch of tilapias from Lake Liambezi, Namibia

Compiled by: Denis Tweddle & Damien Nchindo

Field Document no. MFMR/NNF/WWF/Phase II/3
THE Zambezi/Chobe Fisheries Project assisted the Governments of Namibia and Zambia in hosting the first meeting of the fisheries sub-committee of the Namibia/Zambia Joint Commission from 18-19 January 2011 in Katima Mulilo, Namibia.

This document contains the outputs of the meeting in the form of minutes, agenda and attendees, followed by the presentations made at the meeting. These included presentations on activities by the Ministry of Fisheries and Marine Resources, Namibia, and the Department of Fisheries, Zambia, followed by a series of presentations on the activities of the Zambezi/Chobe Fisheries Project as follows:

- General presentation on project activities
- Presentation on the developments in the Lake Liambezi fishery
- Recommendations of the project for amendments to the fisheries legislation
- Results of the 2008 frame survey conducted jointly in Namibia and Zambia
- Results of the surveys conducted in Katima Mulilo urban market
- Report on the low input fish ranching programme supported by the project
MINUTES OF THE NAMIBIA/ZAMBIA TRANS-BOUNDARY FISHERIES WORKSHOP, HOSTED BY THE INTEGRATED CO-MANAGEMENT OF THE ZAMBEZI/ CHOBE RIVER SYSTEM FISHERY RESOURCE PROJECT

18th – 19th January 2011
Zambezi Lodge
REPUBLIC OF NAMIBIA
MINUTES OF ZAMBIA/NAMIBIA TRANS-BOUNDARY FISHERIES WORKSHOP:
18-19 JANUARY 2011

PREAMBLE

Following discussions by the MFMR/NNF Integrated Co-Management of the Zambezi/ Chobe River System Fishery Resource Project with various key participants in both Namibia and Zambia, it was agreed to hold a workshop for stakeholders to review (a) the current status of the Upper Zambezi fishery along the shared river boundary, (b) progress towards management both at government and community level, and (c) to map the way forward for project and ministerial/departmental activities in the coming year(s).

It was further agreed that the fisheries sub-committee of the Namibia/ Zambia Joint Commission should meet in formal session immediately after the workshop. This meeting would be restricted to nominated members of that sub-committee. The workshop was therefore arranged for the 18th – 19th January 2011, followed by the sub-committee meeting on the afternoon of the 19th January. (APPENDIX 1 – Agendas for workshop and sub-committee meeting).

DAY 1: 18th JANUARY, MORNING SESSION

Opening Remarks

Dr Ekkehard Klingelhoeffer welcomed all participants from both countries (Namibia and Zambia). He set the scene by highlighting the important areas on which the participants should focus and discuss in the coming two days; i.e. progress on the initiatives that are being taken and that should be addressed in the fishery sector by both Namibia and Zambia fisheries management authorities in terms of sustainable resource management.

He further proposed the structure and agenda of the proceedings for the next two days (18th and 19th January) (Appendix 1). This was approved by both countries.

The delegates introduced themselves to each other.

Namibia as a host country took the chairmanship whereby Dr E. Klingelhoeffer (Deputy Director- Aquaculture and Inland Fisheries) chaired the morning session and Mr Bonny Amutse (Deputy Director- Operations) the afternoon and next day morning sessions.

Adoption of the Proposed Agenda

An addition to the agenda was approved; a presentation by Ms Priscah Lilungwe (CPP-NNF) on stocking of water bodies and low input fish farming.
The morning session was occupied by presentations on present activities in the fisheries of the Caprivi area in Namibia and the adjacent area of the Zambezi system in Zambia. These presentations related to activities of the Namibian Ministry of Fisheries and Marine Resources, the Department of Fisheries in Zambia, and the MFMR/NNF/WWF Integrated Co-management of the Zambezi/Chobe River System Fishery Resource Project.

PRESENTATIONS

MFMR, Namibia

Dr Klingelhofer, Director of Aquaculture and Inland Fisheries for the MFMR, made a presentation on the current status of the MFMR in relation to inland fisheries, with a brief overview on initiatives and activities taken in the Caprivi Region by the MFMR (Appendix 2). He shared the presentation with Mr Bonnie Amutse (Director of Operations) and Mr Victor Pea (Director of Policy, Planning and Economics), who presented information on their Directorates, i.e. Law Enforcement, and Policy, Planning and Economics respectively.

The MFMR has the Mandate to sustainably manage the living aquatic resources and promote the aquaculture sector. Its Vision is for Namibia to be a leading fishing nation with a well-developed aquaculture industry. Its Mission is to responsibly manage living aquatic resources continuously to ensure a conducive environment for the fishing and aquaculture sector to prosper.

Dr Klingelhofer described the activities in inland fisheries and aquaculture and explained the functions of the stations in Rundu and Katima Mulilo, and the research station KIFI. KIFI has five core functions: applied research, capacity building, fingerling production, data/information centre, and extension/outreach.

Mr Amutse explained the regulatory framework, including the Marine Fisheries Act, the Inland Fisheries Legislation Act, and the Aquaculture Act, while Mr Pea described the functions of the Directorate of PPE, which is entrusted with the responsibility for developing the Namibian fisheries both nationally and internationally. Within the Directorate of PPE there is a Policy Division entrusted with research and analysis of aspects of fisheries policy, and with socio-economic studies.

DoF, Zambia

Mr Kagoli Muyangali, Principal Fisheries Officer for the Zambian Upper Zambezi fisheries area, summarised the aims and role of the Department of Fisheries in managing the fisheries of Zambia (Appendix 3).

The presentation emphasised that a policy of co-management is being introduced for the Zambian fisheries. It covered law enforcement through monitoring, surveillance and control, the closed fishing season, the need to develop a system for protecting breeding areas,
fishermen licensing, border clearance for fish imports, and the necessity for regular management meetings.

**Integrated co-management of the Zambezi/Chobe River System Fishery Resource Project**

Mr Denis Tweddle (Project Executant) introduced the Zambezi/Chobe project and its goals and objectives, status and achievements so far ([Appendix 4]).

The presentation emphasised the need for community participation in management, and the need for more flexibility in regulations to allow fishermen to adapt to local conditions, as floodplain environments have very different fish populations to main river channels and large lagoons. The need to increase mesh sizes for the cichlid species that form the main economic component of the fisheries was emphasised, while recommending that small mesh nets be allowed, where appropriate, to exploit the smaller abundant species on the floodplains. The presentation emphasised that community structures are in place that will allow effective management of the fisheries, in close collaboration with the MFMR. Fish protection areas have been proposed by many communities and the project is assisting the communities to set these up. Proposals have also been made for fish reserves in Zambia with the assistance of the African Wildlife Foundation (AWF) to protect breeding grounds and thus it is hoped that the two countries can work together to develop these protected areas.

The presentation also emphasised that tourism based on angling is very important locally, with fishing lodges providing employment to the local communities in areas where other economic opportunities are scarce or non-existent. The interests of anglers and fishing communities are identical, i.e. the existence of healthy stocks of large fish to exploit.

**Lake Liambezi Fishery – management by community**

Mr Tweddle made another presentation on the current status and control measures for the fishery at Lake Liambezi ([Appendix 5]).

The Lake Liambezi fishing community at Muyako, eastern Caprivi, has established rules for the fishery on the lake, with stricter regulations on mesh sizes than those in the Namibian regulations. The presentation emphasised that what is happening on Lake Liambezi can act as a model for the other fisheries in Caprivi Region and even beyond.

**Fishery Frame Survey**

Dr Ben van der Waal presented the analysis of the 2008 frame survey to the participants ([Appendix 6]).

This presentation indicated that there are over 4000 makoros now operating in the eastern Caprivi floodplains area, approximately equally divided between Namibia and Zambia. About 20% of the population go fishing. There is a marked difference in structure of fishing
communities on each site of the border, with an average of 6 fishers per village in Namibia and 34 in Zambia. This reflects the existence of larger villages along the shoreline of the main Zambezi River in Zambia, compared with smaller villages spread out on small patches of higher ground throughout the floodplains in Namibia. The presentation further emphasised the widespread acceptance of (a) the fact that there has been a decline in the catches of the larger, more valuable fish species, and (b) the need to manage the fisheries. There is a willingness by fishermen to pay fishing licences. Most fishermen are aware of the existence of the fish disease EUS.

**Katima Mulilo Market Survey**

Dr van der Waal presented an analysis of data from the Katima Mulilo market survey to the participants (*Appendix 7*).

The presentation showed that the market selected for the large cichlid species, particularly the tilapias, although research fishing results show that these species are less common in the rivers and lagoons than other smaller species. Most fish were small and immature, clearly showing that the fishery needs to be managed and that mesh sizes used for the cichlids need to be increased. The data also showed that dried fish tend to come from more distant fishing areas, reflecting the difficulty in maintaining freshness during the time it would take to travel to market. Dried fish had a different species composition, with the catfishes assuming much greater importance than in the fresh fish market.

**DAY 1: 18th JANUARY, AFTERNOON SESSION**

The afternoon of day 1 was taken up by extensive discussions on cross border collaboration between Namibia and Zambia for management of the fisheries. After a preliminary discussion, it was agreed that the meeting should consider the following topics.

1. **Joint Patrols**
2. **Fishery Trade (Export/Import)**
3. **Research Collaboration**
4. **Closed/Open Fish Season**
5. **Catch and Release – Lodges**

**Joint Patrols (Inspectorate – Namibia/Zambia)**

Mr Richard Upingisana – Chief Fisheries Inspector (Namibia) briefed the members on the joint patrols they conducted with their Zambian counterparts. They conducted four joint patrols in the last year, of which two were day time and the other two during the night. He also shared with the participants difficulties they usually faced during patrols, among which were: low level of the Zambezi river creating difficult for boat manoeuvring particularly at night, identifying where the middle of the river was (which creates difficulties in determining whether fishermen from each side of the border were adhering to their respective regulations), and hiding of fisherman who used illegal gears.
Zambian counterparts shared the same sentiments about the difficulties in law enforcement.

It was agreed that, irrespective of difficulties, future joint patrols should be arranged.

**Fishery Trade (export/import)**

Discussions under this topic centred on how cross-border trade in fish to Zambia through Wenela border post should be controlled. At present, there is an important export trade in fish from Lake Liambezi. There are issues of quality control. Fish are exported under ice, but delays can occur in the transport chain that leads to unacceptable losses of quality. Zambia has to inspect, and then issue permits for, import of fresh foods but it appears that these regulations are not strictly enforced. Exports from Namibia fall under the Ministry of Trade and Industry and not under MFMR. Mr Damian Nchindo of MFMR, Katima Mulilo, was delegated to ascertain from the Ministry of Trade and Industry and from the Ministry of Health what phytosanitary permits are needed for fish exports through the Wenela border post.

Protocols need to be established to ensure that fresh fish is transported to market as quickly and efficiently as possible, while it is essential to have safeguards in place at the source of origin (primarily Lake Liambezi) to ensure that the health of the fishing communities is safeguarded as well as its new community management structure. The community in the area should derive the major benefits of its resources by (a) conducting the fishing, and (b) controlling fish trade to the urban market, i.e. Katima Mulilo, from whence it can be distributed and exported by relevant transport businesses, including cross-border trade. Attention was drawn to a previous cross-border trade route for Liambezi fish to Botswana through Satou and Bwakunga and it was suggested this possible route should be investigated.

**Research**

Namibia currently has research programmes in operation, comparing growth rates of important commercial fishes in different waters, and is developing systems for accurate recording of catches. The possibility of extending this programme to Zambia was raised and approved in principle, dependent on availability of research funding.

It was stressed that there is a need for supplementing the present biological research with socio-economic investigations, particularly into the development of the fish-orientated economy around Lake Liambezi, and the potential impacts of closed seasons on local livelihoods. The MFMR/NNF project undertook to explore ways and means of sourcing and funding such a programme.

It was requested by Zambia that the Kwando River should be included in transboundary research studies.
Closed/Open Fishing Seasons

The current situation, whereby Zambia has an annual closed fishing season along the Upper Zambezi River for three months, while there is not one in Namibia, causes considerable difficulties. In effect, there is no closed season because the Zambians simply fish in Namibian waters and therefore increase the already unacceptable pressure on the fish resources.

It was asked whether the closed season was at the right time of year. It was argued in response to this question that the closed season was at the time when most fish species bred, i.e. early in the floods and thus the timing was correct. It was then, however, pointed out that the reason this question was raised in the first place was that, while most fish species may breed at that time, the most important species in the fishery, i.e. the large cichlids and particularly the tilapias, actually breed from about August onwards and suffer very heavy fishing mortality on their breeding grounds as the water level is at its lowest at that time. Nevertheless, the current timing of the closed season at least allows for a reduction of the currently excessive fishing effort and may thus be encouraged.

The other issue brought up for discussion was the hardship that might be faced by fish traders, who are predominantly women in the area, as they would be deprived of their livelihoods for three months of the year. This is a very important issue that needs to be investigated. There are, however, options that can be considered, such as the use of a selective closed season, e.g. prohibiting netting fish in the closed season but promoting the harvesting and marketing of the small, prolific, floodplain species.

It is important to conduct a socio-economic study on the best way to implement a closed season if it is agreed that this is a vital management tool for the fishery. Alternative ways to conduct this survey were discussed. Either the Directorate of PPE in the MFMR could second staff to conduct such a survey, or the MFMR/NNF project could facilitate the appointment of an independent expert.

Catch and release fishing and tourist lodges

The issue of catch and release fishing was raised by the Zambian delegation as it appears to create confusion and tension between tourists and fishermen during the Zambian closed season. Mr Tweddle pointed out that his presentation in the morning session had covered this point. Misunderstandings are best addressed by community awareness programmes. Two major points need to be emphasised in these awareness programmes. (1) The offtake of fish by anglers is tiny compared to catches of other fishermen. Catch and release fishing only rarely leads to the death of the fish caught, probably less than 1%. Numerous research programmes and tagging programmes have verified that fish recover rapidly from capture. (2) The lodges make a large contribution to the economy of local communities in terms of employment and other assistance.
DAY 2: 19th JANUARY, MORNING SESSION

Harmonisation of Legislation and Regulation between Namibia and Zambia

The day began with a presentation by Mr Tweddle on the issues surrounding current regulations (Appendix 8). He stressed the importance of having regulations that are relevant to local conditions on the river and the floodplains so that communities can harvest the diverse resources effectively.

Mr Tweddle’s presentation indicated that the priorities for regulations should be to prohibit the use of the most damaging gears (particularly dragnets and drifting gillnets), while changing other regulations to allow flexibility in harvesting floodplain resources. The main emphasis in such areas should be on empowering communities to regulate their own resources, with the MFMR adopting an advisory role.

The current situation on Lake Liambezi is an excellent example of the approach that should be adopted throughout the area. On the lake, the community has established rules that enable the fishermen to fish for the most valuable species, i.e. the tilapias, while protecting the juvenile fish. The community leaders worked closely with the MFMR Inspectors while developing their rules. This points to the future direction the MFMR should consider, i.e. acting in an advisory and supportive role, instead of being considered as policemen enforcing unpopular laws.

Mr Tweddle’s presentation also explained the concept of “Fish Protected Areas” and how they are being developed in line with the Inland Fisheries Act’s section on establishing “Fish Reserves”. Preparations to establish protected areas in Sikunga and Impalila conservancies in cooperation with the Traditional Authority are at an advanced stage.

In response to the presentation, Mr Kapelwa reiterated the steps that must be followed in the establishment of fish reserves. It was noted thereafter that the approach adopted in the conservancies is correct, follows the guidelines, and has been endorsed by all relevant stakeholders.

The issue of exclusivity in terms of controlling local resources was raised, with the suggestion that resources should be regarded as belonging to all Namibians. The discussion then centred on the finite nature of the resources. It was stressed that the great majority of African inland fisheries have already collapsed and in the vast majority of cases the cause was uncontrolled access, leading to over-exploitation by outsiders with no vested interest in sustaining the resources. Fishing effort has to be strictly controlled to sustain catches, and local fishermen should have first option for permits to fish.

A lengthy discussion ensued on the best way to harvest the prolific, small floodplain species. These species are adapted to rapidly fluctuating floodplain situations by (a) growing rapidly, (b) maturing in a matter of weeks at a very small size, (c) breeding prolifically, and (d) spreading out with the floodwaters into every conceivable habitat. Natural mortality is enormous with only
a tiny proportion of the fish ending up in suitable habitats to survive until the next flood. In these circumstances, exploitation of these fishes for human consumption during the floods using very small meshed nets should not only be tolerated but should be actively encouraged. This is especially the case as during floods the floodplain village communities often face great difficulties in conducting their daily lives.

**Harmonisation of the Inland Fisheries Act with Conservancy Policy**

Discussions were held on how the conservancies could be assisted in development of management structures for their fishing areas and how the MFMR could assist them in this. Mr Pea pointed out that the current Namibian legislation allows for management of natural resources within “nature reserves”. Subsequent to this discussion, Mr Pea and Mr Tweddle investigated this option and discovered that the legislation refers specifically to national parks and game reserves and not to conservancies. This is nevertheless a section of the regulations that should be relatively easy to modify to include conservancies, and therefore provide them with the support they need to establish their own management systems for their waters.

It was pointed out that with the current trend towards establishing conservancies on the Caprivi Floodplains, almost the entire length of the Zambezi River in Namibia will soon be within conservancies, with the potential to develop local management structures for the fisheries throughout the floodplain.

**Stocking of water bodies – low input farming (Ms Priscah Lilungwe CPP- NNF)**

Ms Lilungwe gave a presentation on the project to stock natural small water bodies such as pans and ponds with fingerlings to provide sources of food in areas remote from fishing areas. Management of such ponds is a collaborative effort by the communities concerned (Appendix 9).

This form of aquaculture, unlike the construction of ponds, is low-cost and not labour-intensive, and therefore has tremendous potential to expand the production of fish in the numerous places where such pans and ponds exist in the Caprivi Region and surrounding areas. It is a method which should be actively promoted by the ministries/departments of both countries.

**WAY FORWARD AND RECOMMENDATIONS**

It was recognised that the workshop had been effective in informing the members of the Namibia/Zambia Joint Commission Fisheries Sub-Committee about all the issues that needed to be covered during their deliberations.

Points specifically mentioned were:
1. Harmonisation of regulations between the countries, with the aim of eliminating the most damaging gears.
2. Harmonisation of closed fishing seasons
3. Mesh size: the minimum mesh sizes of 3” (Namibia) and 2.5” (Zambia) are completely inappropriate for a riverine fishery based primarily on tilapias. Here the minimum should be at least 3.5” and preferably 4”. On floodplains, however, small-meshed nets (1” and 1.5”) are appropriate for the numerous smaller species. Nets between 1.5” and 3.5” should not be allowed.

4. The need for a ban on monofilament gillnets

5. Control of fish net sizes by regulating fishing net suppliers.


7. The need to involve other stakeholders (including Traditional Authorities, community leaders and lodge owners) in future meetings.

**CLOSURE**

The meeting was adjourned at 12:45, leaving further planning and arrangements for the next meeting (proposed for the first week in June) to be discussed during the Joint Commission Sub-Committee Meeting in the afternoon.
**Day 1: Tuesday 18th January 2011 (Morning Session)**

*At Zambezi Lodge boardroom*

**AGENDA FOR INTER-GRATED CO-MANAGEMENT OF THE ZAMBEZI/CHOBE RIVER SYSTEM FISHERY RESEARCH PROJECT**

Country presentations on initiatives pertaining to Inland Fisheries Research and Management: Chair: Dr Ekkehard Klingelhoeffer – Morning Session

09h00 Welcome and opening remarks by Dr E Klingelhoeffer

09h05 Introduction of participants

09h20 MFMR/NNF/WWF/NORAD Intergrated co-management of the Zambezi/Chobe River System Fishery Resource Project. Aims, Progress and way forward (Mr D Tweddle – Project Executant)

10h00 Presentation – Zambia

10h30 – 11h00 TEA/COFFEE/JUICE

11h00 – 11h20 Presentation - Namibia

11h20 – 11h40 Lake Liambezi Fishery (Mr D Tweddle)

11h40 – 12h00 Fishers Frame Survey (Prof B van der Waal)

12h00 – 12h20 Katima Mulilo Market Surveys (Prof B van der Waal)

12h20 – 12h45 Discussion

12h45 – 14h00 LUNCH at Zambezi Lodge
Day 1: Tuesday 18th January 2011 (Afternoon Session)

General discussion and mapping of the way forward for the joint commission and for the Project and Fisheries Ministries/Departments

Chair: Mr B Amutse – Afternoon Session

14h00  Objectives of afternoon session (Dr E Klingelhoeffer)
14h05  Cross border collaboration for patrols (Inspectorate – Namibia/Zambia)
14h15  Harmonization of Legislation between countries (Nambia/Zambia/NNF)
15h45  Harmonization of Regulations between the countries (NNF)
15h30  TEA/COFFEE/JUICE
16h00  Harmonization of Regulations (continued)
17h00  End of Day 1 session

Day 2: Wednesday 19th January 2011 (Morning Session)

Chair: Dr E Klingelhoeffer – Morning Session

09h00  Amendment of Inland Fisheries Act and Regulation (Inspectorate/NNF)
10h30  TEA/COFFEE/JUICE
11h00  Recognition of Fish Protection Areas (Mr D Tweddle/Prof B van der Waal/Dr C Hay)
12h00  Research collaboration (Namibia/Zambia/NNF)
12h30  Botswana involvement in cross border collaboration, policy development and committee meetings (Namibia/NNF)
13h00 - 14h00  LUNCH at Zambezi Lodge
DRAFT AGENDA
FOR
NAMIBIA/ZAMBIA JOINT PERMANENT COMMISSION OF COOPERATION SUB-COMMITTEE ON FISHERIES

DAY 2: Afternoon Session: Zambezi Lodge boardroom

Wednesday the 19th January 2011: Chair Mr B Amutse

14h00 Welcome and objectives of Joint Permanent Technical Committee – Fisheries Sub-Committee meeting (Mr B Amutse)

14h10 Introductions of Delegates

14h20 Adoption of the draft Agenda

14h25 Matters arising from last Namibia/Zambia Joint Permanent Commission of Cooperation held in March 2010

1. Cooperation in Fish Marketing
   Discussion

2. Cooperation in Aquaculture/Inland Fisheries
   a. Current status and objective of KIFI
      Discussion
   b. Inland fisheries Act
      Discussion
   c. Harmonisation of Fisheries Acts: presentation by the two countries
      Discussion

3. Any Other Business

15h45 – 16h00 Tea/Coffee/Juice

16h00 Adoptions of the Agreed Minutes of the Sub-Committee

Date and Venue for the next meeting

17h00 Close of meeting
# INTEGRATED CO-MANAGEMENT OF THE ZAMBEZI/CHOBE RIVER SYSTEM FISHERY RESOURCE PROJECT

## List of attendants/participants

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WELCOME TO THE WORKSHOP ON "INTEGRATED CO-MANAGEMENT OF THE ZAMBEZI/CHOBE RIVER SYSTEM"

FISH FOR LIFE =========== FISH FOR ALL

PARTICIPATORY APPROACH/BRAIN STORMING /PAVE THE WAY FORWARD

FISH FOR LIFE =========== FISH FOR ALL

FOCUS: Upper Zambezi Trans-boundary issues

- Current status and initiatives taken by both countries
- Progress towards management both at Government and Community level
- Map the way forward for the existing Project and Ministerial/Directorate/Departmental activities

Structure and Agenda for the next two days

- Current Status of initiatives taken in the Upper Zambezi and Caprivi Region (AM)
- Brain storming: Trans boundary issues/Harmonization of legislation/Research collaboration/Fishery Protected Areas (one full day)
- NAM/ZAM Joint Permanent Commission of cooperation (Last Day PM): Sub committee on Fisheries

FISH FOR ALL

"Research"

WE CAN

"Education"

Thank you

"Livelihoods of Communities"

"Food security"

CAPRIVI REGION INITIATIVES AND ACTIVITIES

1. POLICY and ECONOMICS (DIRECTORATE OF PPE)

2. LAWENFORCEMENT (DIRECTORATE OF OPERATION AND SURVEILANCE)

3. FISHERY RESEARCH AND FISH FARMING (DIRECTORATE OF AQUACULTURE AND INLAND FISHERIES)
**MINISTRY VISION**

- **Mandate**
  - To sustainably manage the living aquatic resources and promote the aquaculture sector
- **Vision**
  - For Namibia to be a leading fishing nation with a well-developed aquaculture industry
- **Mission**
  - Responsibly manage living aquatic resources continuously ensure a conducive environment for the fishing and aquaculture sector to prosper

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**CAPRIVI REGION INITIATIVES AND ACTIVITIES**

**DIRECTORATE OF POLICY, PLANING AND ECONOMICS (V Pea)**

**BRIEF OVERVIEW**

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**CAPRIVI REGION INITIATIVES AND ACTIVITIES**

**DIRECTORATE OF AQUACULTURE AND INLAND FISHERIES (Ekkehard Klingelhoeffer)**

**BRIEF OVERVIEW**

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**CAPRIVI REGION INITIATIVES AND ACTIVITIES**

**DIRECTORATE OPERATIONS (B Amutse)**

**BRIEF OVERVIEW**

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**Directorate of Aquaculture and Inland Fisheries**

**WHAT IS OUR LINE FUNCTION?**

To strike the BALANCE Aquaculture vs Inland Fisheries
INTEGRATED FISH/CROP/POULTRY FARMING SYSTEMS

KAROVO FISH FARM – MODEL FARM

SCIENCE/RESEARCH

STRIKE THE BALANCE

Ministry Initiatives - Aquaculture

Regional Offices
Construction Stage
Planned Offices/Fish Farms
Line Ministry/Fish Farms

KAMUTJONGA INLAND FISHERIES INSTITUTE (KIFI)

KAVANGO REGION

KAMUTJONGA INLAND FISHERIES INSTITUTE (KIFI)

Inland Fisheries/Aquaculture

Directorate of Aquaculture and “Inland Fisheries”

OPM endorsed marriage of the above on 31st August 2006
KIFI OBJECTIVES
FIVE PILLARS (1st)

- RESEARCH (APPLIED)
  - MICROBIOLOGY
  - MARKET SURVEY
  - SOCIO/ECONOMIC STUDY
  - FISH DISEASES

KIFI OBJECTIVES
FIVE PILLARS (2nd)

- CAPACITY BUILDING (TRAINING)
  - “Students”
  - “School Groups”
  - “Short Courses”

KIFI OBJECTIVES
FIVE PILLARS (3rd)

- FINGERLING PRODUCTION
  - Re stock Rivers/Lakes
  - Provide bay fish to small scale fish farmers
  - Re stock Pilot Fish Farms

KIFI OBJECTIVES
FIVE PILLARS (4th)

- DATA/INFORMATION CENTER (ARCHIVE)
  - Electronic media and Paper Form (Journals, Articles etc)

Rundu and Katima Regional Offices

- Katima Regional Office:
  - 9 staff currently
  - 20+ request

- Rundu Regional Office:
  - 9 staff currently
  - 20+ requested

Head Quarters Windhoek

- Kamutjonga Inland Fisheries Institute (Kavango Region)
- Ongwediva Inland Aquaculture (Oshana Region)
- Swakopmund Office (NATMIRC) (Erongo Region)
- Hardap Inland Aquaculture Center (Hardap Region)
- Epalela Fish Farm (Omusati Region)
- Onavivi IAC (Omusati Region)
- Onavivi Fish Feed Plant (Omusati Region)
- Keetmanshoop (Karas Region)
- Luderitz Office (Karas)
- Noordoewer (New) (Karas Region)
- Kamutjonga Inland Fisheries Institute (Kavango Region)
- Ongwediva Inland Aquaculture (Oshana Region)
- Swakopmund Office (NATMIRC) (Erongo Region)
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- Onavivi Fish Feed Plant (Omusati Region)
- Keetmanshoop (Karas Region)
- Luderitz Office (Karas)
- Noordoewer (New) (Karas Region)
KIFI OBJECTIVES
FIVE PILLARS (5th)

EXTENSION/OUTREACH (Promotion/Development)
Service the Communities/Public
- Site inspection/evaluation: aqua potential
- Small scale fish farmers: develop
- Schools: awareness/unlock the minds
- Community self help projects (Integrated)

Thank you
Presentation of the plans for Zambian side of the Zambezi River bordering Namibia:

18th January 2011
Katima Mulilo
NAMIBIA

ZAMBIA PRESENTATION

Kagoli Muyangali
Principal Fisheries Officer
Upper Zambezi Fishery

Summary

• Co-management
• Law enforcement (monitoring, surveillance and control)
• Fishing ban
• Identification and protection of fish breeding areas
• Fishers’ registration and licensing
• Border clearance
• Management meetings

Co-management:

• Sensitize fishing community and other stakeholders (NGOs, Local councils, Traditional Authority etc)
• Designate fishing villages.
• Formation of fishing villages management committees
• Training of Village Management Committees (VMCs)

Law enforcement (monitoring, surveillance and control)

• Effective monitoring of compliance
• Improved surveillance on the water
• Control of illegal fishing and illegal gears to avoid overfishing.

Fishing ban

• Strengthen enforcement by consistent water and land patrols
• Improve compliance (participatory, whistle blowers).
• Conduct sensitization meetings in fishing villages before the closure of the fishery
• Improved budgetary allocation
Identification and protection of fish breeding areas

- Identify the fish breeding areas
- Identify common fish species that breed in identified areas
- Protect those areas from fishing
- Legalize such areas through the Statutory Instruments or formulation of a by-law by the local authority.

Fishers’ registration and licensing

- Sensitize the traditional authority and fishers
- Fishermen should be registered and licensed (record/register of fishers)
- know the population of the fishermen
- know the type of fishing gears being used.

Border clearance

- Improving border controls of movement of fish and fish product into and out of Zambia (issuance of import and export permits)
- Improve data collection and sharing
- Improve rate of clearing fish traders
- Station an officer at the border

Management meetings

- Hold monthly meetings with the fishing villages management committees
- Hold quarterly meetings with Namibian counterparts
INTEGRATED MANAGEMENT OF THE ZAMBEZI / CHOBE RIVER SYSTEM
TRANSBOUNDARY FISHERY RESOURCE

MINISTRY OF FISHERIES AND MARINE RESOURCES

Project: WWF: 9F0792
WWF-Norway: 5012
Norad: GLO-05/312-11

PROJECT GOAL

Shared Zambezi/Chobe River fisheries resources managed sustainably through transboundary coordination and collaboration after the introduction of fully integrated fishery management systems

PROJECT PURPOSE

Implement community-based fishery management for the fishery to benefit all stakeholders, including tourism (sport fisheries) who are reliant on this valuable resource

PROJECT OUTPUTS

Output 1: Better understanding of impact of new Inland Fisheries Resource Act (Namibia) acquired and documented

Output 2: Collaboration on fisheries management achieved between transboundary communities
  — establishment of cross border committee (Namibia and Zambia)
  — input on joint management of shared fishery resource and oversight of closed fishing season

Output 3: Support emergence of local level community fishery groups that assume management responsibility for their fisheries

Output 4: Facilitate development of appropriate fish farming projects in conjunction with MFMR, and also projects utilising existing water bodies and local fish species

Output 5: Monitoring programmes introduced and/or maintained
  — river fisheries survey at Kalimbeza (Namibia) and Ngweshi (Zambia)
  — fish market survey at Katima Mulilo
  — EUS monitoring and biological surveys on rivers and lakes
WHY DO WE NEED A PROJECT TO MANAGE THE FISHERY?

WHAT ARE THE PROBLEMS WITH THE FISHERY?

PROBLEMS

- Everyone associated with the fishery agrees that the fishery in the Zambezi River has declined in the last few years
- Research fishing proves the large bream species are over-fished
- Local communities, tourist lodges are complaining
- Fishermen now have to work a lot harder to catch the same amount of fish as they used to
- This means that there are fewer large fish in the river than there used to be

WHY IS THIS?

- Increase in number of people in area and therefore number of people going fishing
- Increased commercialisation of fishery because of (1) improved road communications to area, and (2) people from outside investing in modern fishing gears and paying people to fish for them
- Introduction of modern, more efficient fishing gears
- Catching fish before they have fully grown and bred to produce the next generation
- Fishing longer and more destructively to catch the same amount of fish as before, therefore making the situation even worse

WHAT CAN BE DONE ABOUT IT?

- Give fishing communities the authority to manage their own resources
- Empower conservancies and/or village fishing committees to formulate their own rules, with guidance from the project and MFMR
- Encourage the setting up of reserves where no fishing takes place to act as breeding and nursery areas to seed the fish- ing areas with new fish stocks
- Keep overall government fishery regulations very short and simple, concentrating only on prohibiting the most damaging gears
- Agree all other regulations at a local level through participation with, and agreement with, the individual conservancies/village committees

PREVIOUS SLIDE, LAST POINT.....

WHY?

Because the floodplain fisheries have very different characteristics in different areas

- Main river channels: fishery dominated by large bream species and tigerfish
- Lagoons: breams but also numerous smaller species
- Shallow streams and pans during flood events only: numerous very small, highly productive and short-lived species
**MAIN ZAMBEZI RIVER, SIDE CHANNELS AND LARGE LAGOONS:**

- Strong regulations to protect valuable large fish species,
- For financial benefit of fishing communities
- To support tourism resource, provides employment and income to rural communities in areas where few other employment opportunities exist

**ISOLATED LAKES AND LAGOONS:**

- Allow wide variety of fishing gears to exploit all types of fish

**TEMPORARY FLOODPLAIN STREAMS AND PANS:**

- Allow exploitation of small species using methods that would be unacceptable elsewhere, e.g. mosquito nets

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Small, but adult, pioneering floodplain species are a valuable, short-lived human food resource. Import and use of monofilament gillnets must be stopped urgently, as they are more effective and increase pressure on already overfished species. Possession of illegal gear to be made a criminal offence even if not being fished (traders supplying such gears as guilty as fishermen using them). Following illegal methods must remain banned under any circumstances:

- Seine nets (dragnets) (possible exception in drying lagoons, only with special agreement with community)
- Drifting gillnets
- Driving fish into gillnets by beating water or bankside vegetation
- Poisons and explosives

---

**DESTRUCTIVE GEARS – TOTAL BAN NEEDED**

- Recreational fishery (predominantly by tourists) not generally understood by Government
- Value of lodges to local communities (particularly employment)
- Target species are tigerfish (stocks generally healthy) and large 'bream' species (stocks over-exploited and in urgent need of management)
- Most operate catch-and-release policy therefore lodges do not have an impact on fishermen’s livelihoods
- Potential for conservancies to manage reserves where catch and release angling practised on payment of rod fees to conservancies
- This would help to resolve conflict between lodge owners and commercial/subsistence fishermen over resource utilisation

---

**TOURIST RECREATIONAL FISHERY**

- Research dragnet
- Dragnet made of monofilament netting
PROJECT ACHIEVEMENTS SO FAR

- Improved understanding of floodplain fisheries dynamics
- Sound biological basis now available for adaptive management
- Thorough groundwork prepared in Namibia for community management based on conservancy principles
- Collaboration on frame survey with Zambia Department of Fisheries
- Lines of communication with DoF established
- Excellent relations established with conservancy and fishing committees in Namibia project area
- Potential for no-fishing reserves accepted in principle by fishing communities
- Recommendations for modification to Namibia Inland Fisheries legislation (but still needs further input to remove excessive gear restrictions)
- Support for LEAD fish ranching programme, which appears to be very successful in its initial phase and has high potential for further expansion
- Good communication and cooperation with tourist angling lodges

WHAT NEXT?

In Namibia:

- Continue to assist conservancies/committees to establish the fish protection areas (FPAs), through Traditional Authority, Regional Council, and MFMR.
- Assist in developing management plans for FPAs and agreements with lodges for catch-and-release fishing on payment of fees to communities
- Ensure revised regulations are gazetted in parliament to ban most destructive fishing gears
- Guide communities to establish their own rules for their particular water bodies
- Assist MFMR in extension and environmental education to ensure communities understand and agree their roles in managing the resources.
WHAT NEXT?

In Zambia:

- Unable to appoint additional project coordinator in Zambia because of financial constraints.
- Project to closely cooperate with Fisheries Department in Sesheke and with Western Province regional officer in Mongu.
- Promote communication/joint operations between fisheries departments in Zambia and Namibia.
- Assist Fisheries Department in strengthening communication with fishing communities.
- Explore role of Royal Establishment in assisting with strengthening community participation in management.
- Explore potential role of existing natural resource committees (set up for wildlife) in managing fisheries resources also.
- Agree harmonised regulations between Zambia and Namibia, particularly on destructive gears.

NOTE:

ZAMBIA’S FISHERIES REGULATIONS PROMOTE COMMUNITY PARTICIPATION IN MANAGEMENT –

THEREFORE: THE COMMUNITIES HAVE THE OPPORTUNITY TO REVERSE THE PRESENT OVER-EXPLOITATION OF THE RESOURCE

WHO ARE THE POTENTIAL ROLE PLAYERS IN ZAMBIA?

- ZAMBEZI/CHOBEB FISHERIES PROJECT
- DEPARTMENT OF FISHERIES
- ROYAL ESTABLISHMENT
- VILLAGE RESOURCE COMMITTEES
- NGOs INVOLVED IN COMMUNITY ACTIVITIES
- KAZA
- ZAWA
- AWF
- ANY OTHERS??

- WE HAVE HAD MEETINGS WITH KEY STAKEHOLDERS FROM THE COMMUNITIES IN BOTH COUNTRIES
- THIS MEETING BRINGS TOGETHER SENIOR GOVERNMENT STAFF AND OTHER STAKEHOLDERS TO DISCUSS THESE ISSUES
- CAN WE ESTABLISH GOOD COMMUNICATIONS BETWEEN NEIGHBOURING COMMUNITIES TO RESOLVE CONFLICTS?
- CAN WE HELP COMMUNITIES IN OUR TWO COUNTRIES TO DEVELOP MANAGEMENT PROPOSALS FOR FISHERIES IN THE CAPRIVI WATER BODIES?
- CAN WE HELP COMMUNITIES TO CONTROL FISHING ACTIVITIES IN THEIR AREAS?
- CAN WE REACH AGREEMENTS ON HARMONISATION OF REGULATIONS BETWEEN THE COUNTRIES?
- CAN WE STOP FISHERMEN USING DESTRUCTIVE FISHING GEARS?
- CAN WE DEVELOP JOINT MANAGEMENT PLANS FOR THE CAPRIVI FISHERIES IN BOTH COUNTRIES?
Lake Liambezi, Namibia:
Fishing community assumes responsibility for fisheries management

Denis Tweddle
Project Executant:
MFMR/NNF/WWF Integrated Management of the Zambezi/Chobe River System Fishery Resource Project

LAKE LIAMBEZI

- Major swamp system centred on Lake Liambezi in Caprivi region
- Lake area about 300 km², of which 100 km² is open water when lake full
- Lake receives water from (A) Kwando River percolating through Linyanti swamps, (B) Chobe River reverses flow direction when Zambezi floods - enters lake from SE, (C) Bukalo channel enters northeast of the lake from Caprivi floodplain in high flood years, (D) Direct rainfall in catchment
- Outflow from lake via Chobe River when floodwaters recede - intermittent and dependent on lake level

LAKE LIAMBEZI LEVELS AND FISHERY HISTORY

- Lake supported important fishery in 1970s and early 1980s
- Dried up in 1985
- Remained dry for long periods until 2000s
- Some inflow in 2000 and 2003 floods, but Google Earth imagery from September 2005 shows dry, largely burnt lake bed with crop fields clearly visible in centre of lake bed
- More water since 2007
- Filled by major floods in 2009 and again in 2010

Flooded village in Lake Liambezi, April 2010

Fishery in 2009 dominated by clarid catfishes with few cichlids
Fishery in late-2010 dominated by tilapiine cichlids
Increased fishing activity at main landing beach for Muyako community.

PROBLEMS:
- Increased fishing pressure and large influx of fishers from outside the local community
- Excessive netting, difficult to move on lake because of fishing nets everywhere
- Most fish exported to Zambian urban areas
- Economic benefits from fishery leaving the area, not accruing to local population

SOLUTION
- Young people around lake set up formal organisation to take control of the situation
- Approached community leaders from both Khutas, Bukalolo and Chinchimani, for assistance in August 2010
- Subkhutas met in September 2010 – resolved to limit effort and manage fishery to maximise economic benefits within the local communities

MANAGEMENT MEASURES INTRODUCED
1) Closure of fishery
   - Muyako community under Chief Liswani took initiative.
   - Announced complete closure of Lake Liambezi fishery from 15 to 22 October, 2010.
   - All fishermen instructed to remove nets from lake during that time.
   - With assistance of MFMR, nets left out in the lake were removed and destroyed.
   - Fishery re-opened on 23 October for registered fishermen.

2) Registration of fishermen
   - During closure, register compiled of all fishermen who would be allowed to fish after re-opening of fishery.
   - Registration restricted to fishermen resident in the area.
   - Outsiders wishing to register informed they could not do so at present.
   - But, consideration given to expanding register in future dependent on health of the fishery.
3) RESTRICTIONS IN ALLOWED FISHING METHODS

- Fishing restricted to passive gillnets
- No seining (drag netting)
- No bashing of water and/or vegetation to frighten fish into nets
- Minimum mesh size set at 3.5" (89 mm) (cf. 3" (76 mm) in regulations of Namibia’s Inland Fisheries Act)
- Proposal to increase mesh size to 4" (102 mm) later

ARE THESE MANAGEMENT MEASURES CORRECT FOR THIS FISHERY?

- Fishing by local community only?
- Effort limitation?
- Mesh size regulations?
- Ban on active fishing gears?
- Effectively ensuring a tilapiine dominated fishery?
- Suitability for an ephemeral water body?

Major problem in vast majority of African fisheries has been influx of outsiders without ties to local community or interest in long term sustainability. Leads to uncontrolled overfishing and depletion of stocks, particularly of larger, slow-maturing species. Restricting fishing to local community members enables effective control. Effective control also allows restrictions on fishing methods, provided agreement is reached by consensus.

Restrictions on mesh sizes and fishing methods

Is 3.5" the right choice of minimum mesh size? Do we have enough data to verify that this will give higher yields than 3" mesh?

We can't be certain, but all available evidence from other African freshwater fisheries based on tilapias indicates that mesh size regulations that protect tilapias from capture until they reach maturity result in optimum catches. Two examples can be given from fisheries in Malawi:

FIRST EXAMPLE, NEXT TWO SLIDES, IS FROM LAKE MALOMBE, ON THE SHIRE RIVER DOWNSTREAM FROM LAKE MALAWI

SECOND EXAMPLE IS FROM THE SOUTH EAST ARM OF LAKE MALAWI, WHERE AN IMPORTANT COMMERCIAL SCALE FISHERY FOR ENDEMIC TILAPIAS “CHAMBO” SUDDENLY COLLAPSED IN THE EARLY 1990s

LAKE MALOMBE: TILAPIA FISHERY COLLAPSE
**Total Catch 1976-92**

Declining chambo stocks attributed to:
1. Excessive fishing effort on adults.
2. Excessive fishing effort on juveniles.
3. Destruction of weedbeds-nursery grounds.

Rebuilding of the Chambo stocks to MSY requires:
1. Total closure for 6-8 years.
2. 10 yrs if small mesh seines and nkacha nets were banned.

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**This relationship began to break down in the late 1980s and the fishery collapsed in the early 1990s.**

**Why did this happen?**

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**SE SOUTH EAST ARM OF LAKE MALAWI**

From 1940s, SE Arm chambo fishery supported 5000 tonnes pa fishery shared between (A) commercial scale open water ringnetting and midwater trawling, and (B) artisanal gillnet fishery with 3.75" minimum mesh gillnet regulation.

Catch data from beginning of commercial fishery showed excellent relationships between catches and total effort, and also influence of changing environmental conditions.

---

3.75" mesh allowed chambo to grow to maturity before capture.

Commercial ringnet and midwater trawls had 4" minimum meshes.

Despite very heavy fishing effort, total annual catches remained relatively stable, even though small meshed shore seines caught unacceptable number of juvenile chambo.

In 1980s, however, new fishing method introduced, open water seining using light attraction at night, known as "kauni".

Kauni changed fishery dynamics, targeting 2-year old fish between 15 and 22 cm in length. Until advent of kauni this year-class was relatively immune from capture - fish too far offshore to be caught in shore seines, and able to pass through 3.5 – 4" meshes of offshore gears.

Result! Collapse of the fishery.

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**LESSONS FOR LAKE LIAMBEZI**

**ECONOMIC VALUE:**
Lake Malombe example shows benefits of fishery focussed on tilapias. Current situation on Lake Liambezi suggests similar scenario.

**MANAGEMENT PRIORITIES:**
Protect tilapias until maturity:
- Do not allow gillnet meshes between 2" and 3.5": these target immature fishes when growing at fastest rate in their life cycle, having survived heavy natural mortality experienced by fry and small juveniles.
- Do not allow seines (dragnets): ‘nkacha’ nets on Lake Malombe, ‘kauni’ on SE Arm of Lake Malawi destroyed economic value of fisheries.

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**CONCLUSIONS (1)**

- Lake Liambezi was a thriving tilapia fishery in the 1970s and has now become one once again.
- The community has proved capable of regulating the fishery.
- The management measures adopted are intuitively correct for a tilapia-based fishery.
- The fluctuations in the lake level mean that conclusive evidence on optimal yields is virtually impossible to obtain, but the fishery should be closely monitored.
- The efforts of the community to take responsibility for management deserve full support from MFMR.
CONCLUSIONS (2)

LAKE LIAMBEZI FISHERY PROVIDES AN OUTSTANDING EXAMPLE OF THE SORT OF INITIATIVE THAT OUR RESPECTIVE GOVERNMENT FISHERIES DEPARTMENTS SHOULD BE SUPPORTING.

IT SHOWS THAT COMMUNITIES CAN TAKE RESPONSIBILITY FOR THEIR OWN NATURAL RESOURCES

AND

IT SHOWS THAT THEY CAN BE TRUSTED TO DEVELOP SOUND MANAGEMENT STRATEGIES, INCLUDING REGULATIONS THAT MAY NOT TALLY WITH GOVERNMENT REGULATIONS (e.g. MINIMUM MESH SIZE) BUT THAT ARE BEST SUITED TO THE LOCAL SITUATION

ACKNOWLEDGEMENTS

This presentation summarises our knowledge on the lake fishery, based on the efforts of all MFMR staff and students in Katima Mulilo, who are thanked for their contributions through our extensive discussions about what is happening to Lake Liambezi.

The Muyako fishing community is also thanked for sharing information on the steps they are taking to manage the fishery.
INTEGRATED MANAGEMENT OF THE ZAMBEZI / CHOBE RIVER SYSTEM TRANSBOUNDARY FISHERY RESOURCE
MINISTRY OF FISHERIES AND MARINE RESOURCES
Project: WWF: 9F0792
WWF-Norway: 5012
Norad: GLO-05/312-11

SUGGESTIONS AMENDMENTS TO REGULATIONS (NAMIBIA) AND FACTORS TO BE TAKEN INTO CONSIDERATION WHEN FORMULATING REGULATIONS IN ZAMBIA

NAMIBIA

Present fisheries regulations are too prescriptive – not suitably flexible to deal with different fisheries.
Regulations aimed specifically at fishing in main river channels – do not take into account widespread floodplain fisheries for different fish species assemblages.
Long lists of banned fishing gears counter-productive - fishermen will not respect unnecessary regulations that prevent them efficiently harvesting resources.
Regulations to protect large species in major river channels irrelevant on floodplains where small, pioneering, highly prolific species are targeted.

REGULATIONS SHOULD THEREFORE BE AGREED AT LOCAL COMMUNITY LEVEL.

GEARS TO BE EXPLICITLY PROHIBITED ARE:

- Any form of dragnet: Mounted differently to gillnets and instantly recognisable. Should be easy to prepare definition for law.
- Drifting gillnets. Only static gillnets should be permitted. Law should also prohibit setting fixed gillnets across entrances to lagoons and backwaters, and restrict nets set across channels to not more than 50% channel width.
- Driving fish into gillnets by beating water and/or bankside vegetation.
- Monofilament gillnets: Their use may make fishermen think stocks are improving, but in fact they are increasing effective effort five-fold on species that are already over-exploited.
- Poisons and explosives.

ESTABLISHMENT OF FISH PROTECTION AREAS

THE INLAND FISHERIES RESOURCES ACT OF 2003 PROVIDES FOR THE ESTABLISHMENT OF FISH RESERVES

THIS OPTION IS BEING STRONGLY PROMOTED BY THE CAPRIVI COMMUNITIES, PARTICULARLY IN THE CONSERVANCIES

NUMEROUS COMMUNITIES HAVE APPROACHED MFMR AND THE PROJECT FOR ASSISTANCE IN SETTING UP RESERVES

STEPS HAVE BEEN TAKEN USING THE EXISTING LEGISLATION BUT BETTER LEGISLATIVE SUPPORT IS NEEDED FOR THE COMMUNITIES TO TAKE CONTROL OF THE RESERVES THEY ARE ESTABLISHING

AT PRESENT, THE ENABLING LEGISLATION IS AS FOLLOWS, NEXT SLIDE:

Section 22 of the Inland Fisheries Resources Act of 2003 – legislation for the establishment of fish reserves

22 (1) The Minister, on his or her own initiative, or in response to an initiative of any regional council, local authority council or traditional authority, and in consultation with regional council, local authority council or traditional authority concerned, may by notice in the Gazette declare any area of inland waters as a fisheries reserve if the Minister considers that special measures are necessary –

(a) to preserve the aquatic environment
(b) to protect, preserve or rehabilitate the natural environment of fish, related ecosystems including wetlands, lakes, lagoons, nursery and spawning areas, which are essential to maintaining the integrity of an ecosystem, species or assemblages of species;
(c) to promote regeneration of fish stocks;
(d) to protect fish resources and their environment from destruction, degradation, pollution and any other adverse impacts through human activities that threaten their health and viability.
This legislation is quite specific
Conservancies, particularly Impalila and Sikunga, have proposed the establishment of reserves, to be called “Fish Protected Areas” or FPAs.

A request from these two conservancies to establish FPAs, following the wording of the legislation, is at present being guided through the approval stages.

Once these FPAs have been approved by the traditional authority, regional council, and MFMR, what happens next?

Community empowerment is the key to the success of these initiatives

The conservancies act gives these organisations the authority to manage the natural resources in their areas

Fish is a natural resource – like wildlife and like forestry, but fish resources at present do not appear to be covered and instead remain under a separate act

This issue needs to be resolved!

Impalila Conservancy has already established the Kasaya Channel as a fish protection area

Help, including enabling legislation, is needed to protect and manage the FPA

The conservancy has agreements in place with lodges for their tourists to fish in the channel using catch & release, on payment of a fee to the conservancy

Unfortunately, there is no legislation currently in place to make independent boats and anglers pay

I have witnessed very rude behaviour by a young South African angler who refused to pay and abused conservancy officers

This issue needs to be addressed, both in legislation and in ministry inspectorate support for the community

To: Bukalo Traditional Authority
To: The Regional Governor
Regional Council
Katima Mulilo

6 December 2010

Dear Sirs,

Recognition of Fish Protection Areas under management of the Conservancies of Sikunga and Impalila

This is a joint letter from the Conservancy committees of Impalila and Sikunga expressing declarations of fishing reserves in terms of Section 22 of the Inland Fisheries Resources Act of 2003 (see attached section of the Act below).

In our conservancies we are seriously concerned about the continuous decline in fisheries stocks in the Zambezi and its floodplains and would like to prevent further deterioration of our fishery resources. We therefore make a formal request which we title “Fish Protection Areas”, the goal of these FPA’s is to create areas where fish can live, grow, and breed undisturbed and we hope that this will prevent further deterioration of our fishery resources. We therefore submit our formal request which we title “Fish Protection Areas”.

A joint letter from the two conservancy committees (Impalila and Sikunga) is at present being guided through the approval stages; it is at present being guided through the approval stages. A request from these two conservancies to establish FPAs, following the wording of the legislation, is at present being guided through the approval stages.

We therefore hereby request the approval of the Traditional Authority in Bukalo and Regional Council in Katima Mulilo to approach the Minister to declare, by notice in the Gazette, the areas proposed in the attached document as fisheries reserves (here called Fish Protection Areas) under Section 22 of the Inland Fisheries Resources Act of 2003.

Yours faithfully,

[Signature]

[Name]

On behalf of the conservancy committee of [Conservancy name]

[Date]

[Address]

[City]

[Country]
NEED FOR REVIEW OF THE LICENSING SYSTEM

 Licensing fishermen is NOT a system of taxation! It is a mechanism for controlling fishing effort by controlling the number of licences issued.

 The present system, whereby licences are issued by one person in the Regional Council, is unworkable. Only about 20% of present fishermen are licensed.

 Transferring responsibility to fishing committees/community organisations/traditional authorities/angling organisations/lodges will result in greater uptake of licences and will support a system of registration and management by the empowered communities. MFMR has a major role to play in the development of a workable system to replace the present unsatisfactory situation.

IN CONCLUSION:

 THE NAMIBIAN FISHERIES ACT ON ITS OWN IS A GOOD PIECE OF LEGISLATION

 THERE ARE, HOWEVER, INCONSISTENCIES WHEN OTHER NATURAL RESOURCES LEGISLATION IS TAKEN INTO CONSIDERATION

 THE ISSUE OF CONFLICTING FISHERIES AND CONSERVANCY LEGISLATION NEEDS TO BE ADDRESSED

 REGULATIONS NEED TO BE AMENDED TO EMPOWER LOCAL COMMUNITIES SUCH AS CONSERVANCIES AND TRADITIONAL AUTHORITIES TO MAKE THEIR OWN DECISIONS AND TO MANAGE THEIR OWN FISHERIES RESOURCES

 REGULATIONS SHOULD BE SIMPLIFIED SO THAT THEY:
 (a) ALLOW FOR LOCAL VARIATIONS IN FISH STOCKS AND PERMISSIBLE FISHING GEARS, AND
 (b) ALLOW FOR COMMUNITY MANAGEMENT OF FPAs

ZAMBIA

 FACTORS TO BE TAKEN INTO CONSIDERATION
 Harmonisation of regulations with those of Namibia
 Need to prevent use of damaging fishing gears
 Establishment of Fish Protected Areas
 Joint operations with Namibia
 Anything else??
Analysis of a frame survey of fishers in 2008
Ben C W van der Waal
Integrated Management of the Zambezi/Chobe River System Fishery Resource Project
For Ministry of Fisheries and Marine Resources, Namibia
Report to the Namibia/Zambia Joint Permanent Commission – Fisheries Sub-Committee meeting & associated transboundary workshop 18/19 January 2011, Katima Mulilo
Present address: Department of Zoology, University of Venda, South Africa
Ben.vanderwaal@univen.ac.za

Survey team consisting of five Ministry of Fisheries and Marine Resources, three Department of Fisheries of Zambia and nine staff members of the Zambezi/Chobe Project were divided into two teams operating independently along the Zambezi and Chobe Rivers.
Survey from September 2008 to January 2009
Induna of each village/camp questioned
Sample of fishers from each village questioned
Data entered by team at Kamutjonga Inland Fisheries Institute.
Data from Botswana team and some data on mesh size not included in this report – not yet available

Number of villages/camps visited
<table>
<thead>
<tr>
<th>Namibia</th>
<th>Zambia</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>486</td>
<td>89</td>
<td>575</td>
</tr>
</tbody>
</table>

Total number of persons in villages/camps – headman data
<table>
<thead>
<tr>
<th>Namibia</th>
<th>Zambia</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>17,044</td>
<td>15,256</td>
<td>32,300</td>
</tr>
</tbody>
</table>

Average number of persons per village/camp
<table>
<thead>
<tr>
<th>Namibia</th>
<th>Zambia</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>35</td>
<td>171</td>
<td>56</td>
</tr>
</tbody>
</table>

Total number of canoes
<table>
<thead>
<tr>
<th>Namibia</th>
<th>Zambia</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>2,140</td>
<td>2,028</td>
<td>4,168</td>
</tr>
</tbody>
</table>

Total number of fishermen
<table>
<thead>
<tr>
<th>Namibia</th>
<th>Zambia</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>2,754</td>
<td>3,000</td>
<td>5,754</td>
</tr>
</tbody>
</table>

Percentage fishers in village/camp
<table>
<thead>
<tr>
<th>Namibia</th>
<th>Zambia</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>16.2</td>
<td>19.7</td>
<td>17.8</td>
</tr>
</tbody>
</table>

Average number of fishers per village/camp
<table>
<thead>
<tr>
<th>Namibia</th>
<th>Zambia</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>5.7</td>
<td>33.7</td>
<td>10</td>
</tr>
</tbody>
</table>

Villages and fishing camps [some missing, no GPS data] visited by teams during the frame survey in Zambia and Namibia

Basic statistics of the fishers on the flood plain based on data from village headmen

Population size of fishing villages in Namibia and Zambia – in Zambia lesser but larger populations

Distribution of fishers on the floodplain

Population size of fishing villages in Namibia and Zambia – in Namibia lesser but larger populations
Knowledge of EUS amongst fishers: do you know this disease?

- Yes
- No
- Have never seen it
- Have not even heard of it
- Other opinion

<table>
<thead>
<tr>
<th></th>
<th>Namibians</th>
<th>Zambia</th>
<th>Stated</th>
</tr>
</thead>
<tbody>
<tr>
<td>Namibia</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Zambia</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Riverside</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Yes: 
- Namibians: 80.0%
- Zambia: 40.0%
- Riverside Not Stated: 20.0%

No: 
- Namibians: 40.0%
- Zambia: 80.0%
- Riverside Not Stated: 60.0%

Other opinion: 
- Namibians: 20.0%
- Zambia: 60.0%
- Riverside Not Stated: 80.0%
Fish sales on the Katima Mulilo Open Market for the period November 2007 – May 2009

Ben C.W van der Waal
Integrated Management of the Zambezi/Chobe River System Fishery Resource Project
For Ministry of Fisheries and Marine Resources

Report to the Namibia/Zambia Joint Permanent Commission – fisheries Sub-Committee meeting & associated transboundary workshop 18/19 January 2011, Katima Mulilo

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Occupancy of the 108 available stalls at fish market November 2007 to May 2009 – higher occupancy during winter

Total estimated weight of fish offered at fish market - annual value more than N$ 10million

Daily estimated weight of fish entering market

- Daily average weight of fresh fish entering market 1081 kg
- Daily weight of dry fish entering market 162 kg
- Dry fish as fresh weight [factor of 5] 808 kg
- Daily average total weight of fresh fish entering market 1889 kg
- Estimated total fish weight sold on market for a year period [assuming 300 selling days] 567 000 kg

Diversity of species offered on market

- 60 of 83 known fish species of region were recorded on market – 43 as fresh, 49 as dried
- Much higher diversity recorded than earlier surveys reflect increase in fishing intensity and commercialization - people make money with all types and sizes of fish

But: Composition of fish offered on market:

- Complete domination by cichlids 84% of numbers 78% of weight

A chart showing the occupancy of the 108 available stalls at the fish market from November 2007 to May 2009, with a higher occupancy during winter.

A graph illustrating the daily total weight of fish entering the market with polynomial trend (6th order) to show possible trends, indicating that fresh fish is more prevalent in spring-summer, while dried fish is more prevalent in winter.

A table summarizing the total estimated weight of fish offered at the fish market, with an annual value exceeding N$ 10 million.

A graph showing the diversity of species offered on the market, with 60 of 83 known fish species recorded, and a complete domination by cichlids in terms of both numbers and weight.
Composition of fish sold on market as numbers [red = cichlids]

Composition of fish sold as percentage weight [purple = cichlids]

Composition of fish communities using Index of Importance, collected with fleet of gillnets at five stations over 10 years [adapted from data from Hay 2009]

CONCLUSION: Fisheries of floodplain is selective
- No agreement between experimental catches and species offered for sale on market:

Biological surveys indicate the river system is dominated by smaller non-cichlid species

But

Market is dominated by cichlids

Length distribution of important cichlids sold on market

INDICATES mainly immature specimens are caught

Mean and modal lengths of fish offered for sale

<table>
<thead>
<tr>
<th>Fish species</th>
<th>Mean length of fresh fish on market</th>
<th>Proportion [%] of fish sold under maturity size</th>
<th>Length at 50% maturity</th>
</tr>
</thead>
<tbody>
<tr>
<td>O. andersonii</td>
<td>23.4</td>
<td>80</td>
<td>27</td>
</tr>
<tr>
<td>O. macrochir</td>
<td>22.9</td>
<td>71</td>
<td>25</td>
</tr>
<tr>
<td>T. rendalli</td>
<td>23.4</td>
<td>35</td>
<td>21</td>
</tr>
<tr>
<td>S. macrocephalus</td>
<td>26.5</td>
<td>46</td>
<td>22</td>
</tr>
</tbody>
</table>
**Lengths of tigerfish and African pike**

**CONCLUSION:** mainly small immature tigers for sale

![Graph showing lengths of tigerfish and African pike](image)

**Price of fresh fish on market**

**cichlids all at top prices**

![Graph showing price of fresh fish on market](image)

**Pricing of fresh fish**

- Fish at the market are sold in bundles or small similar size groups
- Roughly by similar length but not by weight

**Price per kg was investigated:**

- Large fluctuation in price asked per kg

May depend on:

- **Fish size**
- **Freshness**
- **Market demand**
- **Time of day**

**Distribution of price per kg for fresh threespot tilapia at the market**

- very wide variation – N$4 to over N$50 per kg

![Graph showing distribution of price per kg for fresh threespot tilapia](image)

**Price per kg for length groups of threespot tilapia, O. andersonii**

- small and large fetch lower price

![Graph showing price per kg for length groups of threespot tilapia](image)
CONCLUSIONS:

- Price realized is sensitive to fish species.
- Highest price for certain cichlid species for which a premium is paid.
- Species with best prices are *Sargochromis*, *Oreochromis* and *Tilapia rendalli*.
- Size of the fish also plays a role in price determination – medium sized fish fetch a better price than very small or large specimens of same species.
- These fish are then sought by fishers using effective gillnets, right locality or they increase success by applying illegal methods as seining or bashing.
- Fish prize also influenced by factors such as availability, freshness, time of day.

Dry fish composition sold at market:

- Price per kg for dried fish per species: cichlids fetch best prices.
CONCLUSIONS:
- Non-cichlids form a large portion of dry fish (45% - numbers and 41% weight).
- Of cichlids, Serranochromis spp form an important part of dried fish on offer.
- Dried fish are brought in from long distances, deep in the flood plains as they can keep much longer than fresh fish.
- Many dried tilapia and also other fish are small and immature.
- Weak trend in decrease in price per kg with increase in individual weight.
Fish Farming Program
Namibia Nature Foundation – Country Pilot Project - Sponsored by – GEF through UNDP - ICEMA- NNF.

By Priscah Lilungwe
The Fish Farming Project Coordinator
Caprivi and Kavango

Program overall objectives.
- Develop a suitable design and management regime for viable low-input fish pond production and Seeding water bodies with Fingerlings (baby fish).
- Implement low-input fish ponds in the selected CPP – ICEMA Pilot sites.
- Establish a training/extension system for preparing other households to produce fish.

Impact of Fish Farming on the Natural Resource (Rivers) Socio-Economic Factors.
- A Decrease in Destructive Fishing Practices and Over-fishing
- Creation of Alternate Supplies of Fish Through Communally Owned and Small Family Managed Fish Ponds
- An Increase in Availability/Consumption of Competitively Priced Protein Through Improved Production

Fish Farming Program accomplishments.
- Stocking of more than 30 natural water bodies in Caprivi region.
- Introduction of low input fish farming in Kavango region.
- Construction of Ten man made ponds at Malengalenga in partnership with regional council, MFMR

Site preparation

CPP- ICEMA Pilot sites.
- Machita site - a natural pool near the Lake Lyambezi that was dug by the road construction company.
- Nyunyu-a former gravel pit that holds rain water. Periodic (site).
- Malengalenga – low land area which was given to a certain group of people for Fish Farming development.
- Chemiheto – a dam which was dug for cattle drinking purposes.
- Satotwa – natural pool along Nkurenkuru road
- Shikanduko- A sandy pit which holds rain water near Ncante.
- Mavanze – gravel pit at Sauyemwa location
Species (fingerlings) used for stocking - each has a unique role to play under farming conditions:

- **Tilapia rendalli** - Redbreast (feeds on detritus).
- **Oreochromis andersonii** - Threespot (feeds on aquatic plants and small animals on the surface of the pond).
- **Oreochromis macrochir** - Greenhead (feeds on aquatic and small animals on the bottom surface of the pond).

These fishes are stocked together to maximize use of food in a production system.

**Growth Monitoring.**

- The Lead Fish Farming program monitors growth and health of fingerlings with monthly site sampling.
- Tilapia have bred at the Pilot sites (stocked February 2010), with some fish reaching 25cm (in Nov 2010).
- Some sites are difficult to sample due to high water levels, but new strategies, methods and gears for fish collection are being prepared.

**CPP-ICEMA Pilot site**

<table>
<thead>
<tr>
<th>Pilot site</th>
<th>Site name</th>
<th>Status/Activity</th>
<th>No. Of Fingerlings</th>
<th>Specie Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>Zilitene</td>
<td>Machita</td>
<td>Fully stocked and waiting harvesting due in February</td>
<td>3000</td>
<td>Oreochromis andersonii (Three spot), Tilapia rendalli (Red breast), Oreochromis macrochir (Greenhead)</td>
</tr>
<tr>
<td>Lusese</td>
<td>Nsuru</td>
<td>Fully stocked waiting harvesting due in July</td>
<td>2500</td>
<td>Oreochromis andersonii, (Tilapia rendali)</td>
</tr>
<tr>
<td>Malengalenga</td>
<td>Tishangane</td>
<td>Excavation of ten ponds manually</td>
<td>Requires brood stock catch</td>
<td>Requires licensing, permission to catch fish for stocking</td>
</tr>
</tbody>
</table>

**Harvesting time**

- Communities share fish right at the site, sometimes conflicts may raise during fish distribution.

**Program Challenges**

- Difficult to catch/harvest fish in some ponds
- Lack of fingerlings supply to stock other potential sites

Aquaculture is the answer to reduce pressure on capture fishery, let both countries practice it seriously...

**GOOD DAY...**