

Extent of Participation in Co-management on Lake Tanganyika, Zambia

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Abstract

A study was conducted through administration of questionnaires, personal interviews and group discussions in the three strata along the shores of Lake Tanganyika Fishery in Mpulungu district to assess the extent of participation in co-management in conserving fish stocks. Using simple random sampling method, a total of 110 respondents (60 fishers and 50 non-fishers) were selected; Data was analyzed in SPSS. The results indicated that there were 11 village conservation and development committees (VDCs) that existed and were established by UNDP-GEF/LTRIMP-project but were not working and 3 of them were based at Chipwa, Chitili and Kapata protected areas. In all, there were 77 VDCs covering the four strata and more than 56 were in the first three strata at the time co-management was introduced in the 1990s. The study also revealed that the Resource users' actions undermined the VDCs' and the entire co-management activities resulting in an unsustainable management of the Lake resources. The VDCs also lacked skills and legal power for operating savings and credit services and for implementing the agreed goals and objectives of the institution. The resource users also lacked the much needed information and extension education and services in fisheries management. There was no significant change in the users' attitudes, perceptions and cultures so as to contribute significantly in the management of the Lake. In conclusion, the co-management approach apparently was ineffective in conserving fish resources in Lake Tanganyika. There was need to build VDCs' capacity by providing relevant extension education, equipment, legal empowerment and sustainable financial means or resources.

Keywords

Conserving, Fish Resources, Co-management, Lake Tanganyika

1. Introduction

Lake Tanganyika, located in Southern-Central Africa, is the second largest lake by volume in the world and the largest in Africa (ZEMA *et al.*, 2012). The lake basin covers about 231,000km², and extends into parts of Rwanda, Democratic Republic of Congo, Burundi, Tanzania and Zambia. Lake Tanganyika boasts of over 300 species of fish most of which are endemic (ZEMA *et al.*, 2012). The Zambian part (6%) of Lake Tanganyika is one of the major commercial fisheries, which provide occupation for the communities in Mpulungu in terms of fishing, fish processing and trading opportunities, income and a valuable source of protein (DoF Annual Report, 2000; Lupikisha *et al.*, 2011). The Lake is famous for its flourishing fishery based on some commercial sardine-like

clupeids fish species namely *Limnothrissa miodon* and *Stolothrissa tanganicae* as well as centropomids of the genus *Lates* namely *L. stappersii*, *L. angustifrons*, *L. mariae* and *L. microlepis* and endemic fish used as aquarium and ornamental species (Munyandorero and Mwape 2005).

Nearly 9000 fishers, were directly involved in fishing activities in Zambian waters, implying that an estimated 20,000 family members, derived their livelihood from that occupation (Lupikisha *et al.*, 2011). There were about 800 nets that were used to target *Clupeids* and *Lates* species (Lupikisha *et al.*, 2011). There were also some big investments such as fishing industrial companies that provided processing and storage services and collectively boosted international trade for riparian countries (Lupikisha *et al.*, 2011). However, according to DoF (2014) annual report, fish production in Lake Tanganyika fell from 16,341

metric tons in 2012 to 10,310 metric tons in 2013, implying that the fishery contributes less than 20% annually of total fish production in the country.

Despite all this value to the people, the lake had not been managed effectively by the users because Lake Tanganyika was dominated by artisanal fishers, who viewed the fishery as an open-access resource (McCay and Jentoft, 1998). An open-access fishery, or sometimes considered as a common property resource, has no property rights or other controls to access (McCay and Jentoft, 1998). As such there was very little done to change the attitude and perception of fishers in matters related to fisheries management although in 1990s the phenomenon of co-management was adopted and introduced in many commercial fisheries of Zambia including Lake Tanganyika in 1998. Co-management was seen as a measure to control fishing effort by establishing property rights for the village conservation and development committees (VCDCs) in order to forestall problems (GRZ, 1996; Nyikahadzoi, 1998). The VCDCs are the community groups that were formed in order to enforce fisheries regulations in co-management arrangement for Lake Tanganyika fisheries, Zambia (Simbotwe, 2012). The state also empowered the local communities to have a share of roles, responsibilities and rules for proper integrated management of the fishery within its jurisdiction (Government of the republic of Zambia, 1996; Nyikahadzoi, 1998).

Before co-management, the government employed various coercive powers and management measures which did not bring expected results because of poor implementation and lack of fishers' participation in the planning and management

(Government of the Republic of Zambia, 1996; Nyikahadzoi, 1998). However, the co-management concept and centralized regime continued to operate side by side while encountering political, economic and social challenges (Reynolds *et al.*, 1999; UNDP-GEF project, 2006). Generally, the Government-centred management of the world's fisheries was fading with very little progress if not at all (Jentoft *et al.*, 1998; Sharp, 1997). This study, whose main aim was to assess the extent of participation in co-management on Lake Tanganyika, was conducted in three strata (I, II and III) of Mpulungu district, along the shores of Lake Tanganyika.

2. Materials and Methods

2.1. Description of Study Site

The study was conducted along the shore of Lake Tanganyika in Mpulungu district, located in the southern part of the Lake. Lake Tanganyika is a large inland body of standing water located at an elevation of 760 meters above sea level. Its coordinates are 6°0'0" S and 29°30'0" E in DMS (Degrees Minutes Seconds) or -6 and 29.5 (in decimal degrees). Its UTM position is QP73 and its Joint Operation Graphics reference is SB35-08 (www.getamap.net/maps/zambia/zambia.../_tanganyika_lake).

The fishery area covered only about 2000 km² of the surface area and a shoreline of 238 km stretching from Kalambo falls bordering Tanzania to Nsumbu area bordering Congo DR (Pierrie, 1989). Although the fishery had four strata; in this study only the first three based in Mpulungu districts were covered (Lupikisha *et al.*, 2011).

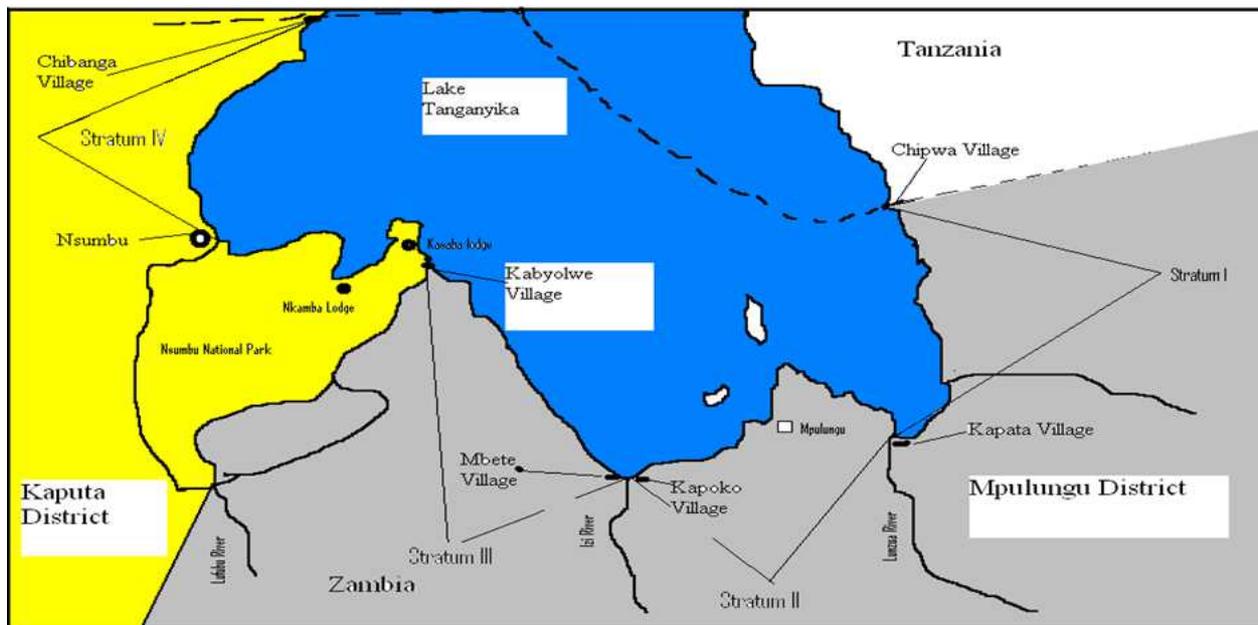


Chart 1. The study site at Lake Tanganyika Fishery in Zambia (Source: Jorgensen *et al.*, 2006).

2.2. Sample Size

The Zambian side of Lake Tanganyika, comprises 83 villages with about 8430 fishers (Lupikisha *et al.*, 2011)

which are structured in four strata (I, II, III and IV), with 17, 18, 21 and 27 villages, respectively. The total number of registered fishers in three sampled strata was 5000. Three villages; one from each stratum were randomly selected for

the study. Combined qualitative and quantitative methods, including conducting a purposeful sampling to select a population of 110 participants, who included: 60 fishers and 50 non-fishers were carried out. The selection of these categorical variables of participants enabled the authors to examine the level of participation of specific groups rather than simply an overall measure of representation.

2.3. Data Collection

Primary data was collected from the selected individuals using semi-structured questionnaires that were administered to them through personal interviews and observations. The questionnaire contained questions on local people's awareness of co-management, their views regarding participation in co-management activities, household level information and other qualitative information, including such as some socio-economic factors. Other questions required the respondents to give answers on local co-management structures in the area, what roles the structures played in conserving fish resources, how effective the structures were in managing fish resources, what the solution was towards strengthening co-management, what the level of community participation in managing fisheries resources was in the area and what factors motivated/ did not motivate local leaders to participate in fisheries management activities in the area.

An initial reconnaissance survey was conducted to examine wording of the questions and thereafter, changes to the questions were made. Secondary information from various sources including internet, for journals, books and other documents, as well as project reports from the Department of Fisheries and the Copperbelt University were collected.

2.4. Data Analysis

Descriptive statistics were used for summarizing and presenting data from the surveys. Statistical package for social sciences (SPSS) was used for data analysis. The analysis assisted in understanding the situation in greater depth and detail. Microsoft Excel was used to come up with graphs, charts and tables.

3. Results and Discussion

3.1. Socio-economic Factors

The study revealed that there were much more youths, aged between 18 and 30 years, who were engaged in fishing on Lake Tanganyika (Figure 1).

The youths are perceived to be very energetic to paddle boats and operate various fishing gears. This observation is in agreement with Fasina (2013) who reported that this age bracket of respondents in the study is youthful and likely to be enthusiastic to carry out fishing i.e. casting and drawing in nets vice - versa rowing of the boat. In this study it was observed that the majority of the youths were attracted to fishing because they lacked formal education. Unlike non-fishers who were engaged in business and other economic

activities (Figure 1), most males began fishing at an early stage in life and were equipped with knowledge about the benefits realized in fishing before they went to school (Lupikisha *et al.*, 2011; LTA, 2012). Some of the children also found it difficult to access schools because of distances, poor and inaccessible roads; consequently that impeded them to progress with their education. In stratum I and III it was earlier reported that 14.3% did not have any type of school within 5km of their area (Lupikisha *et al.*, 2011). The results also seem to suggest that youths were not attracted to non-fishing activities, probably because they had limited or no initial income for capital investment to engage in business and other economic activities.

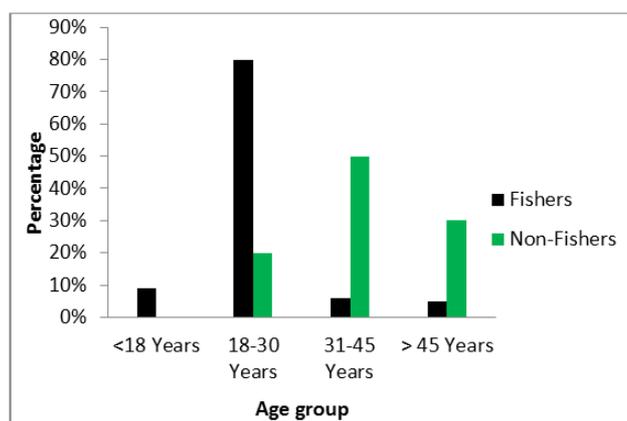


Figure 1. Age group of fishers and non-fishers.

However, the relatively low percentage of fishers above 31 years (Figure 1), may suggest that most of them were unfit to carry out any physical and labor intensive jobs, while some were boat and fishing gear owners, who chose to stay away from hard jobs. This observation agrees with West (2001), and Mwango and Musonda (2002), who reported that the majority among the fishing communities were youths who were employed as gear operators. This was in contrast with LTA (2005) frame survey report for Lake Tanganyika that indicated that the majority of the fishers along the Lake shore were those above 30 years.

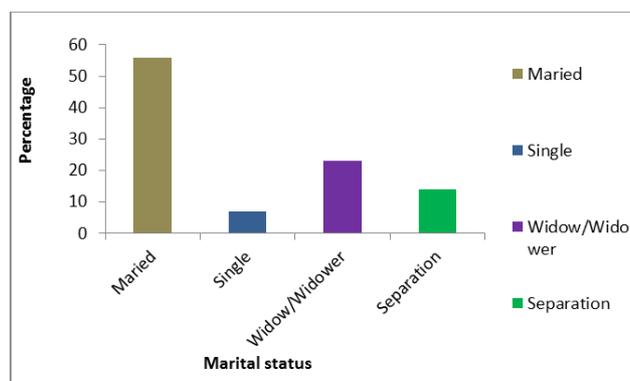


Figure 2. Marital status of the respondents.

The study has shown that the majority (56%) of the respondents were married (Figure 2). However, there was

still something worth noting concerning the widows, separated and the divorced. It was to a certain extent common to find a lot of adults with families, having multiple sexual partners, which promoted high HIV/AIDS prevalence across the whole population, hence the increase in number of widows/widowers (Figure 2).

It was further noted that most families had a number of dependents per household, which ranged from less than 3 to 6 (Figure 3).

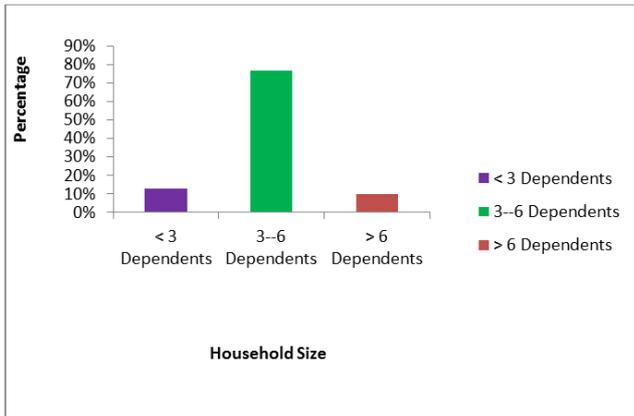


Figure 3. Their average household size.

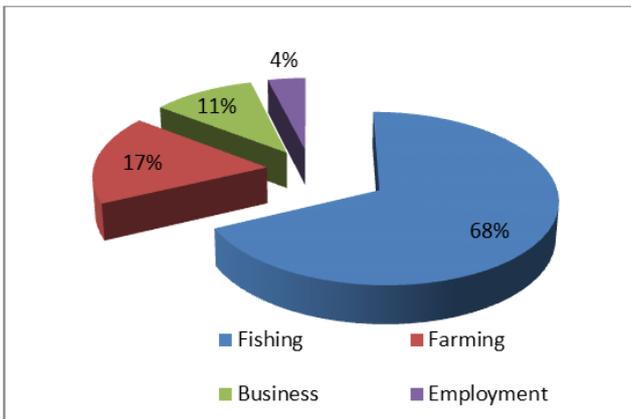


Figure 4. Major economic activities of household heads.

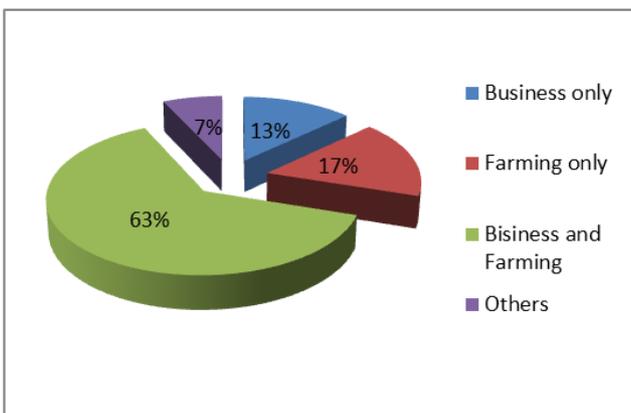


Figure 5. Economic activities of Non-fishers.

The majority (68%) of the respondents were engaged in

fishing, 17% in farming, 11% in business and only 4% were in employment (Figure 4).

In the same vein, the study also noted an increase in people engaged in business and farming activities among non-fishers (Figure 5).

The majority of those engaged in non-fishing economic activities were adults of ages above 30 years. That category represented people with family size above three and the majority of those were women traders who could fend for themselves after being divorced, separated or become widows. Jorgensen *et al.*, (2006), reported that poverty levels were high among the women headed households, especially, the divorcees and widows. Somehow, that motivated them to participate in the promotion of the sustainable development of fisheries and a precautionary approach in fisheries management, conservation and utilization of the fisheries resource.

3.2. Fisheries Rules and Regulations

The respondents although were aware of the existence of fisheries rules and regulations, they however, viewed them differently. More than half considered them to be good and yet others claimed to have viewed them as being bad because they stopped them from engaging in illegal fishing activities (Figure 6).

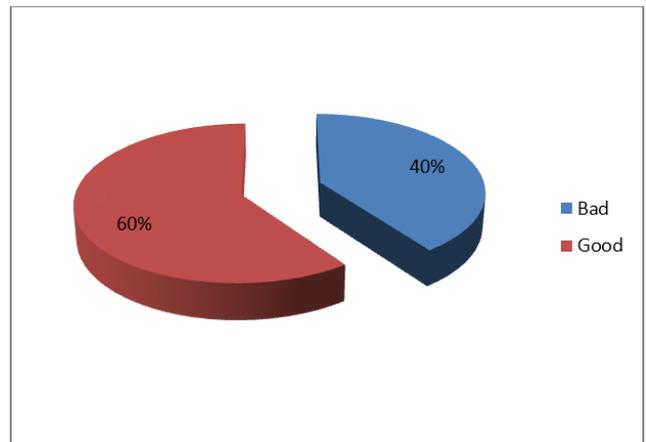


Figure 6. Perception of fisheries rules and regulations.

According to the Fisheries Act of 2011, no person is allowed: to use explosives or firearm for fishing; to use any trawl net or bottom drag net; to alter or interfere with the natural configuration of the terrain; to drive or direct fish towards a stationary net; to set any net across the width of any river, channel or lagoon; to use equipment for fishing which does not conform to any standard prescribed for that type of fishing equipment; to use any weir or fishing equipment which is prohibited or use for fishing, nets that are of a number and size exceeding that which is permitted under this Act.

Despite that they did not suggest any alternatives. Furthermore, the study revealed that respondents were very much aware of the presence of co-management structures, which comprised the Department of Fisheries (DoF), Fishery

Management Committee FMC (the mother body), Stratum and the Village Community and Development Committee (VCDC).

The results also revealed that although three major co-management structures existed, the VCDCs in particular were not operating and that no committee meetings were held and no reports were given, no data collection and revenue collection, as well as minimum surveillance and enforcement patrols were done. According to Simbotwe (2012), the 11 VCDCs that were present were established by the UNDP-GEF project in the year 2011, although they were some that already existed in protected areas on the Zambian side of Lake Tanganyika, which included: Chipwa, Kapata, Chitili, Kasakalawe, Katoto and Musende.



Figure 7. Some VCDC members giving their views on Co-management activities at Mbete village (August 2014).



Figure 8. Illegal fishing gears and methods.

Generally, co-management structure and the stakeholders seemed to have not performed well in their roles and responsibilities. The majority of the respondents indicated that there was much prevalence of the use of illegal fishing gears and methods in the fishery, which was not supposed to be the case if an effective and efficient fisheries management body was in place. The few VCDCs present in the villages

were not functional either because there were not receiving any incentives to motivate them to work.

This study is in agreement with Lupikisha *et al.*, (2011), and Petite and Shiptom (2012), who reported the decrease in fish catches in Lake Tanganyika due to overfishing. The enforcement of the fisheries regulations still remained the responsibility of the central government through the Department of Fisheries (The Fisheries ACT, 2011; ACF/FSRP, 2009; Reynolds *et al.*, 1999).

About 79% and 67% of the respondents revealed that stakeholders had no powers to formulate the constitution and by-laws respectively. Similarly, the local leadership and the VCDCs were also limited with legislation and customary powers and authority to implement some of the activities. However, the decentralization policy has devolved powers and authority to local resource users, however, issues of reliance on Government, ill-awareness, literacy, etc. could be the main problem.

More than half (58%) of the respondents identified the Department of Fisheries as the only institution that was able to enforce fisheries laws and regulations, followed by police (22%), 4% by others, 3% by local leaders and another 3% by all fishers.

Although most of the respondents recognized Chitili, Kapata and Kasakalawe as established protected breeding areas, the majority of fishers did not view them to be so (Figure 9).

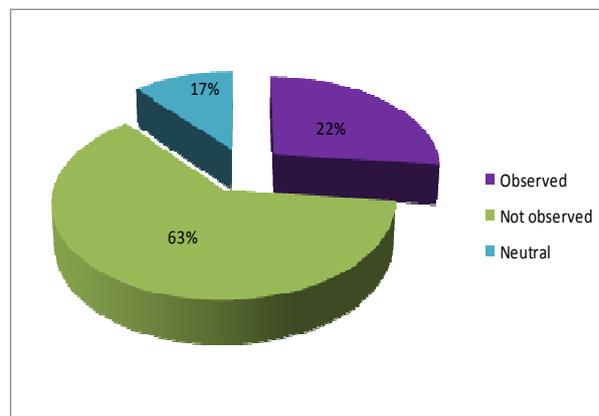


Figure 9. Fishers observance of protected areas on Lake Tanganyika.

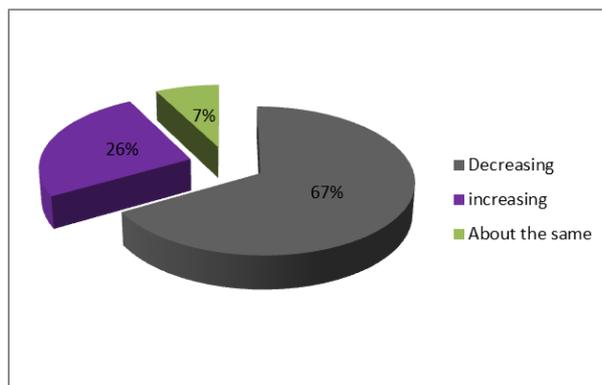


Figure 10. Status of fish catches in protected areas of Lake Tanganyika-Mpulungu.

The performance of the protected areas indicated that fish catches were decreasing due to overfishing (Figure 10).

For example, the protected breeding area at Chitili Village where the VCDCs stopped working ended up being overfished.

Although the results were dependent on site specific experiences, the majority of the respondents generally claimed that fish catches were decreasing now compared to 10 years ago in the Zambian part of the Lake. Although perception alone may not be conclusive, Figure 11 also agrees that indeed catches were really decreasing over time, probably not only due to overfishing alone but partly as a result of climate change.

Overfishing generally as a result of use of destructive gears and methods had been noted to be among the major problems and source of concern for Lake Tanganyika fishery (Smart Fish, 2013; Petite and Shipton, 2012). Overfishing in its real sense implied mismanagement of the fish resources. This therefore, shows the co-management approach was not effectively implemented as stakeholders' participation was decreasing, whilst fisheries lawlessness was increasing.

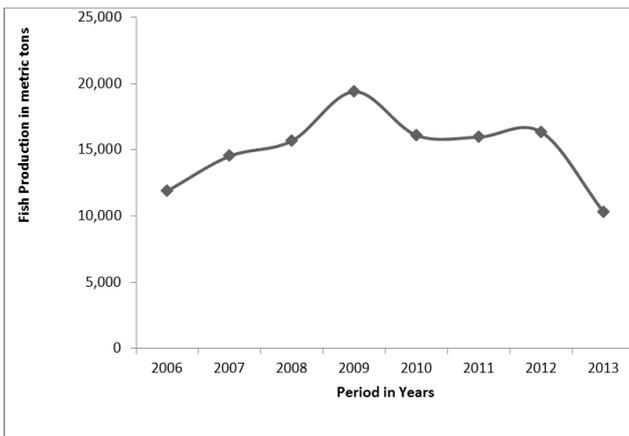


Figure 11. Fish Production (2006-2013) on Lake Tanganyika.

Based on this study, the co-management approach was slowly being abandoned, despite the Fisheries Act, of 2011 having provided for local level management. It appeared the constitution and the fisheries by-laws require thorough clarification and explanation by the concerned parties. As observed in the present study, the only institutions that were considered with such powers to enforce fisheries regulations were the Fisheries Department, the police and the local court which had statutory laws. It followed therefore, that the functions, roles and responsibilities in co-management arrangement might have not been shared equally or appropriately resulting in the ineffectiveness of the entire program. Further, the customary laws of the local leaders and communities were not applied sufficiently to produce effective collective action in enforcement of fisheries regulations. It was like that in situations where the application of statutory laws faced political interest of some locals. Under such circumstances, groups of people, whose common goals and shared norms were upheld and respected

often prevailed and tended to achieve their aspirations. That suggested that enforcement of fisheries regulations by managers were weak in the face of criticisms arising from socio-economic and political alienated despisers. However, Pomeroy, (1995) and Bulayi, (2001), noted that fishing communities under certain conditions could regulate access and enforce rules through traditional or community institutions. The authors also found that the underlying causes of the failure to manage fisheries were often of social, economic, institutional and/or political origins. Furthermore, it appeared as though local leaders were not sensitized also about the use of their powers in fisheries management; hence they were not fully involved in planning and policy formulation. However, official reports at the Department of Fisheries (DoF) indicated that traditional leaders were among the pioneers together with DoF and Council. Something might have gone wrong along the way, such as; non-continued provision of sitting allowances during meetings, non remittance of a share of penalty fees, etc.

3.3. Resource Constraints, Income and Expenditure Patterns of the VCDC

Almost all the respondents indicated that the VCDCs were not generating or receiving finances through subscription and membership fees, neither from penalty fees nor from NGOs. The VCDCs did not realize any revenue through levies for example, which was their absolute mandate since they lived and operated without law.

The VCDCs were once charged with responsibility to collect fees but were later suspended over failure to account for such funds. Based on this study, there seemed to be a public outcry pertaining to the committee members' rapid accumulation of wealth via corrupt practices and many others. The study equally showed that the VCDCs and other committees in co-management had no bank accounts except for the Fishery Management Committee (the mother body) whose bank account also closed recently. Generally, successful fisheries management operations required substantial and orderly flow of finances particularly raised as revolving funds from and by the community itself. A similar recommendation for co-management on Lake Kariba was suggested when it was observed that the institution could not operate effectively without funds (Nyihakodzoi and Songore, 1999; World Bank, 2004).

3.4. Views of Local People About Co-management and Level of Their Interaction

The study revealed that there were very few stakeholders who interacted with the local people in co-management. In the same way, fishers were not so much involved in co-management activities such as decision making, implementation, monitoring and surveillance, formulation of rules and regulations, etc. Consequently, co-management could not produce the desired results and eventually failed to manage the resources. The majority of the respondents

recognized Department of Fisheries and Zambia Police as the main institutions that they worked with in co-management activities. The Department of Fisheries was the key player in co-management activities and legitimately owned full responsibility over resource management, whereas the rest of those listed contributed very little. Among the majority of stakeholders present in the district that would have participated included: fishing companies, local government, councilors and other government departments and NGOs, but alas, only few identified themselves with co-management.

4. Conclusion

Co-management had been ineffective and the resources continued to decline over the years due to little input from resource users. Fishers accepted the idea of shared management responsibilities between the government and the fishing community. However, there was need for much information and extension education to the fishers and other stakeholders about how co-management operated. Overall, management of the fishery is via the fisheries Act albeit with limited success owing to inadequate resources. The structures, roles and functions in co-management were equally lacking. Co-management in Mpulungu illustrated a clear lack of local community participation in definition of environmental problems and priorities. The national resource management efforts often failed since there were no genuinely active involvement of community members at all levels of management.

The local community also lacked empowerment through the law in order to conduct co-management programs effectively. There was need to build VCDCs capacity by providing relevant skills, equipment, awareness, and legal empowerment, technical and financial resources. Finally, the importance of fisheries co-management for management of Lake Tanganyika fishery remained an indispensable option in conservation projects. It was widely accepted that co-management was indispensable and that it needed to be strengthened and be rebuilt so as to manage the fishery effectively.

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