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HISTORICAL ACCOUNTS OF LAKE VICTORIA'S FISHERIES TRANSFORMATION

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Abstract

Having diversity of historical accounts on similar case normally tends to jeopardize validity of the case being examined. Lake Victoria's fishery is one of the earliest fishing occupation which has faced contradictory accounts on its transformation from artisanal to commercial fishery. This papergives a historical account from the local perspective (fishing communities) on fishery transformation that has taken place in Lake Victoria. A total of 246 fishers from fishing dependents communities in three islands of Lake Victoria were involved. A Cross-Sectional Research Design was abided whereas both probability and non-probability sampling techniques aided selection of respondents both in fish capture and offshore fisheries activities. Data from personal interviews and focus group discussion were equated to proper variables for analysis using Statistical Package for Social Sciences (IBM –SPSS 19.0). Findings from study revealed adiversity of accounts on the fishery transformation. Strikingly even respondents who were identified in this study to had lived and experienced transformed fisheries gave different accounts. The noted diversity of historical information regarding fish stocks statistics, depletion of fisheries resources, and introduction of exotic fish species justified how important are reliable information on fishery transformation. With different scholars reporting different information on

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similar case, apparently tend to jeopardise any initiative geared at revamping fishery potential. This call for concerted cooperation and coordination efforts of several organizations and agencies to harmonize statistics on Lake Victoria's fishery. This will aid to minimize inadequacy and unreliability of data regarding fisheries for now and in future.

Keywords:

1. Introduction

Lake Victoria, with a total catchment area of 250,000 km^2 and water surface area of 68,800 $km^2$is a treasured natural resource which provides livelihood to multitudes of surrounding communities. In 2011 Lake Victoria Basin Commission (LVBC) estimated about 35 million people living and deriving livelihood directly or indirectly from the Lake Victoria basin. Fishery which is the major sector to riparian communities encompasses a variety of activities ranging from in-water fish capture to activities undertaken at shoreline, including fish processing, boat and net making/repair, retail and whole sale businesses, plus other ancillary activities. Fishing itself covers enormous number of individuals including those involved directly with fishing (fishers and fish workers in both pre- and post-harvest activities) and those who buy and trade fish or its products. Apart from supporting fisheries, Lake Victoria stands as an important avenue for transportation, source of hydro-electric power, source of water for domestic use and irrigated agriculture, tourism, recreation and as a repository for human, agricultural and industrial waste (Gichuki, 2003; LVFO, 2011).

For years, fisheries in Lake Victoria continued to hold a remarkable contribution to peoples livelihoods until in the early 1990s when the lake's fisheries resources came under increased exploitation pressure (Abila, 2000). The demand to meet needs of rapidly increasing population was amongst factors mentioned by LVBC (2011) to have put very high pressure on natural resources of the basin rendering to loss of lake's biodiversity. Other documented causes include clearance of wetlands and other natural vegetation along lake shores for fishing and non-fishing activities (Gichuki, 2003; Kangalaweet al., 2008; Tumbo, 2008), prolific growth of algae and invasion of water hyacinths which invaded fishing grounds and blocked water ways (LVEMP, 1997; Kateregga and Sterner, 2008), pollution of water environments due to dumping of

untreated effluents from industries and other human activities (Balirwa,1995; LVBC, 2011; Marcela,1996).

Increased market demand for Nile Perch (Latesniloticus) and or its products resulted into increased fishing pressure (Bwathondi, 1990; Jansen, 1997; Gehebet al., 2007; Warui, 2007; Odadaet al., 2009), climatic change marked by shortage of rain which resulted into lowered water level (Awangeand Ong'ang'a, 2006), predation behaviour of Nile Perch which resulted into depletion of other fish species (Okaronon and Wadanya, 1991; Witte et al., 1992; Gehebet al., 2007; Kateka, 2010).

Since then diversity of catch declined (LVBC, 2011) and consequently employment and levels of earnings among fishers became less secure leaving many households destitute (Abila, 2000). The demand for fishery resources in areas predominantly inhabited by fishing communities such as in islands of Lake Victoria outweighed supply from the lake and households tended to consume less fish contrary to previous two decades (Bokea and Ikiara, 2000; Abila, 2003; FAO, 2011). Much pressure on local demands for fish and its products became easily noted in these communities tremendously pushing up prices on local markets (Jansen, 1997; Ajangale, 2007). The Nile Perch that previously dominated in catch were almost totally moved into export depriving natives of fish and fish workers of employment in traditional fish processing.

Since then dwindling of fish catch and or disappearance of native fish species became eminent into Lake Victoria's fishery (Warui, 2007; Kateka, 2010). This happened along with decline of other aquatic resources which were common to fishers' sight early before 1990s. Way back before the 1990s, Lake Victoria's ecology was characterized by enormous biodiversity inhabited by over 500 species of fish, 90% of which were Cichlids belonging to Haplochromisspecies (Witte et al., 1992). Coulter (1986) recalled that during early 1950s Lake Victoria used to be known as a water body which boasted the most diverse fish environments on earth.

In attempts to revamp the ecological health and fisheries potential of Lake Victoria, governments in the three countries sharing the lake have devised several measures. For Tanzania, the government has adopted a participatory co-management approach as per National Fisheries

Policy of 1997 (URT, 2005) which led to formation of Beach Management Units (BMUs). The formation of BMUs aimed at improving community participation in surveillance and management of fisheries activities and to stop detrimental fishing practices such as using poison or dynamite, use of illegal fish nets and other unscrupulous fishing practices.

Although the prevailing difficulties of making a living from Lake Victoria's fisheries has triggered concern to various scholars, inadequate coverage on historical accounts of fisheries transformation has prevailed particularly accounts from local fishing dependent communities who has lived and experienced a shift from artisanal to commercial fishery.

2.0 Research Methodology

Fishing communities in three islands of Lake Victoria Tanzania were surveyed, namely Bwiro Island in Ukerewe District, Mwanza; Mazinga Island in Muleba District, Kagera and Lukuba Island in Musoma Rural District, Mara. Both Islands are inhabited by fishing dependent communities whereas fishing is the main income generating activity. This study adopted a cross-sectional research design whereas data were collected using interviews, focus group discussions and observation methods. A total of 246 randomly selected respondents in different strata were involved in this study. These included fishing crews, fish traders, fish mongers, boat owners, fishnets and machine repairers, and off-shore fish processors. Random selection of fishers was aided by the register of residents which acted as sampling frame provided by village governments in collaboration with BMU offices. Subsequent focus group discussions were organised from different clusters of respondents. By virtual of their positions, key informants were invited for further discussion to clarify some issues. The structured questionnaire stood as main tool for data collection because of its versatility in covering a wide range of issues whereas both open ended and close ended questions were administered. Several modalities for conducting interviews were designed to suit the respondents' availability. For example, fishers' interviews were conducted at their dwellings while for respondents working in off-shore fishery activities the interviews were conducted at their work places. The appropriate time for interviews was scheduled to favour each category of intended respondents. Interviews to fishermen were conducted during their resting hours while to respondents in off-shore fishery activities were conducted during working hours.

At times where contradictory information was identified during personal interview, a focus group discussion refuted such differences whereby individuals in groups argued and finally a consensus reached. A total of 90 focus group discussions were conducted and separate groups were formed for different category of individuals meant to solicit information that generally had a bearing on that particular group.

Several issues which at first seemed difficult to comprehend and disclosed during formal interviews, were revealed during observation. For example, while it was difficult for fishers to admit for the involvement in illegal fishing, juvenile Nile Perch fish which were observable along several landing sites either in raw or processed forms, and this confirmed the prevalence of illegal fishing practices. According to Axinn and Pearce (2006) observation has the advantage of being able to allow researchers to put themselves into the shoes of respondents, and this allows them to observe a situation as it happens.

The collected data was processed prior to analysis. Data processing was done sequentially, and involved cleaning, sorting, coding and finally entering into SPSS spread sheet version 19.0 ready for analysis. Information from focus group discussions and other qualitative information were coded whereby it involved defining qualitative information into categorical values before being subjected to descriptive analysis where measures such as frequencies and percentages were computed. Quantitative information was analysed using descriptive statistics whereas measures such as percentage, mean, maximum and minimum values were computed. In some circumstances cross tabulations analysis were run to establish associations between and among variables using a Pearson Chi-square analysis.

3.0 Results and Discussion

For the last two decades fishing communities around Lake Victoria basin have remarkably experienced a dramatic transformation of fisheries from being a locally based artisanal to commercial fishery, hence attracting influx of people into fishery sector and huge capital investments. Consequently, people's lives changed dramatically particularly island dwellerswhose major part of livelihoods depended on fisheries. The following subsections provides a description of historical accounts of fisheries, artisanal and commercial fishery, as

were gathered from respondents and other secondary sources. The chapter also provides an in-depth analysis of people's livelihoods during this era.

3.1 Fisheries Resources During ArtisanalFishery

Information on stocks of fisheries resources in Lake Victoria were given by respondents in this study in an attempt to verify the abundance of diverse fisheries resources stock as was similarly reported by LVFO (2014). Of the three categories of interviewed respondents in this study, both adults and elders admitted to have witnessed abundance of different fish species commonly captured along shoreline in shallow waters. Both adults and elders in this study cited haplochromine cichlids as the earliest fish specie to have dominated fishery of Lake Victoria. The described abundance and dominance of haplochromine cichlids is similar to what prompted one of early biologist Graham (1929) saying:

"so great are their numbers that I have contemplated suggesting trawling them, in order that they may be used for manure in Kenya colony."

This implied that Haplochromine cichlidsfetched low market value to communities residing along the lake basin due to abundance of other native fish species. In another account Witte et al. (1992) indicated that during artisanal fishery Lake Victoria was inhabited by over 500 species of fish over which 90% were cichlids belonging to genus Haplochromis. The artisanal fishery system was common in all riparian communities and fisheries resources were in abundance. A similar account was given by Greenwood (1974), Witte et al. (1992), Kaufman and Ochumba (1993), and Seehausen (1996); whereby all of them at different duration documented the abundance of multispecies of Lake Victoria which formed a special delicacy to the lake shore community.

Apart from admitting of the abundance of haplochromine cichlids species, during interview elders recalled the existence of several endemic fish species plus many more other native species.Elders accounted that several of fish species which were abundant during artisanal fishery had almost completely disappeared in catch, as only a small number can still be captured. A survey report by LVFO (2006) indicated that by 1990s there were only three major species

dominating Lake Victoria's fishery, namely, Nile Perch (Latesniloticus), small pelagic comprising mainly the dagaaRastrineobolaargentea together with mixed species of haplochromines, and Tilapia (Niloticusesculenta) (Kaufman and Ochumba, 1993).

During this study, fishers aged 56 years and above were in better position in giving historical accounts regarding artisanal fishery which was common in riparian communities. Amongst fishers aged 35-55 years, 38.6% articulated to have experienced the abundance of fishery resources during artisanal fishery. About 76.4% of young people (18-35 years) could not precisely reveal what prevailed during artisanal fishery apart from narrating story tales and hear-say from adults and elders. While this group may seem less experienced regarding artisanal fisheries in the area, the narration of story tales from elders indicates that there has been effective historical information sharing between the younger generations and the elderly people. Story-telling is one of the important mechanisms for sharing information and experiences among community members (Mkwizu, 2016).

Respondents showed varied responses regarding the inception of declining fisheries resources. A large proportion of them (59.3%) mentioned 2000s as the time fishing communities started to experience remarkable decline of fisheries resources, while 23.6% and 17.1% indicated 1990s and 2010s respectively (Table 1).

Table 1: Duration when the Decline of Fisheries Resources was noted by Respondents (%)

Category of Fishers	Early 1990s	During 2000s	During 2010s	Total (N=246)
Youth	8.1	29.7	8.5	46.4
Adults	10.6	27.6	7.7	45.9
Elders	4.9	2.0	0.8	7.7
Total	**23.6**	**59.3**	**17.1**	**100**

Source: Computed from Field Data (2012).

Further cross-tabulation of data showed respondents' varied experiences regarding the onset of declined fisheries resources. Majority of elders recounted to have started experiencing the decline of fisheries resources in early 1990s with remarkable disappearance of most native aquatic species. Majority of youth and adults recalled the duration of 2000s as the onset of remarkable decline of fisheries resources. This shows that each age category of respondents had at some instances lived and experienced the decline of fisheries resources with remarkable experiences on the decline of fish catch in their beach localities.

The noted decline of yield in fish capture varied depending on the three most fished species. While Nile Perch catch was reported by fishers to have peaked up during 1990s, Sardine fishing faced shortage of crews because many fishermen turned into Nile Perch fishing which accrued high remuneration at that particular moment. The observed trend of changed fishery is similarly reported by LVFO which shows trends of fish catch in Lake Victoria during the 1990 - 2010 period. Through focus group discussions with fishermen in all three surveyed islands, it was discovered that many of fishermen resumed Sardine fishery by the end of 2000s because of the decline of remuneration from Nile Perch fishery following European market closure.

Apart from the decline and or disappearance of native fish species, respondents mentioned the disappearance of other resources such as aquatic animals, birds and reptile species along with the disappearance of natural tree species and wetland resources. Previously such resources were part and parcel of the lake's ecosystem therefore its decline threatened survival of different species. Some birds such as cormorant and kingfisher had fish feeding frenzy by easily capturing fish in shallow water. It is obvious the destruction of wetland and catchment areas deterred such ecosystems from adequately supporting a diversity of aquatic species (shrimps, insects, snails, frogs, micro-protozoans, birds and fish) over which eventually jeopardizes the fishery sector as a whole. Normally the presence of such organisms are vital for wetland ecosystems whereby they provide food web linkages between plants, microorganisms and other animals.

One old man at Lukuba Island named MaligoMtembanya recalled the existence of kingfisher species (Corythornisleucogaster) and cormorant species (Phalacrocoraxlucidus)locally known as Mulobhi and Bata maji respectively.These birds used to enjoy feeding frenzy snatching fish in

shallow waters. He narrated that it now very hard to come across such birds and other animals for example Otter (locally named as FisiMaji) because they used to feed on fish in shallow waters, which are currently difficult to find. Figure 1 shows some of the birds and animal currently not easily spotted in shallow waters of Lake Victoria

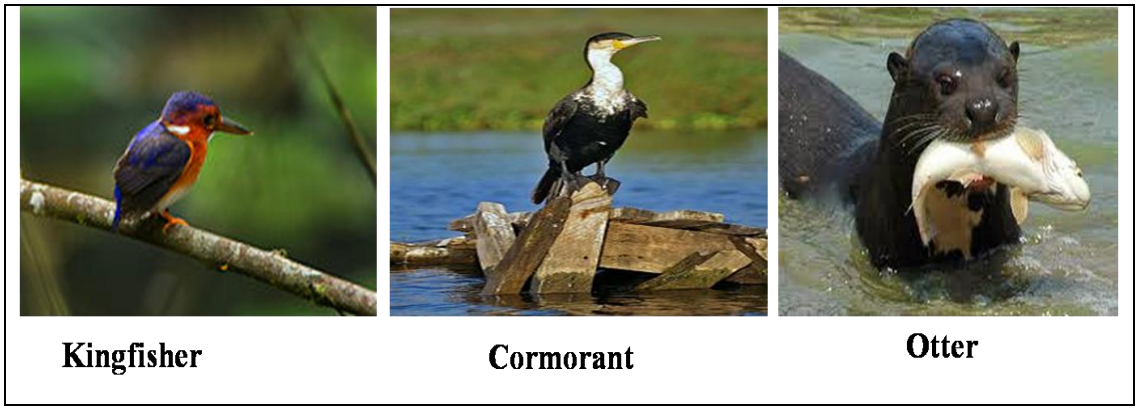

Figure 1: **Some of Aquatic Species that has disappeared in Shallow Water of Lake Victoria**

Source: FishBase (2012)

During focus group discussion, a group of eight elders at Bwiro Island accounted that during artisanal fishery, fishing was mainly conducted in shallow waters and in river confluence where fishes were abundant. They recalled further that the commonest fishing gears were basket traps, hooks, seine nets of papyrus trees and spears. These were the kind of traditional fishing gears made from locally available materials. In other account, Kateka (2010) reported that during artisanal fishery even transport of fish was entirely done on foot and head load, and fishing was at subsistence level benefiting mainly communities living near the lake shore.The presence of canoes and sewn-plank boats propelled by paddles was observed in the study areas as used in fishing operations. This shows the persistent use of traditional fishing gears despite the invention of modern ones. This was claimed to be due to high cost involved in acquiring modern fishing gears such as an outboard motor engine. Figure 2 shows a canoe sailing in one of the lake's islands as was observed during this study. Uses of such traditional fishing vessels and gears have continued to be the most afforded by ordinary fishermen.

Figure 2: Fishermen in a Canoe Heading to Fishing

Source: Field Survey Observation (2012).

Various fish processing technologies have been used during artisanal fishery to enhance the shelf-life of fish and/or its products, thus facilitating transport to distant markets. The use of traditional fish preservation technology such as fish smoking and sun-drying was observable in all the three surveyed islands. Fish salting was preferred by fish processors for the preservation of Nile Perch because of its fat composition, suggesting that it was not in much use before emergence of Nile Perch. In one conversation with seven fish processors at Bwiro Island, it was revealed that salting and sun-drying method for Nile Perch was preferred rather than smoking in a Kiln which demanded more firewood that was scarce.

3.2 Introduction of Nile Perch into Lake Victoria's Fishery

Although respondents in this study could hardly tell precisely the duration when Nile Perch was stocked into Lake Victoria, they recalled the duration when Nile Perch was encountered in catch for first time. Fishers aged 56 years and above, 86.4% mentioned 1980s when Nile Perch catch was first encountered, while 13.6% did not remember (Table 2). The former category comprised of fishers who declared to have formerly witnessed shift from a multi-species artisanal fishery to commercial fishery dominated by three major species (Nile Perch, Tilapia and Sardine). A majority of the respondents (61.7%) indicated to have noted the appearance of Nile Perch in catch by early 1980s. Young fishermen (18-35 years) mentioned 1980s as they were told by their elder friends or relatives. However, a larger proportion (63.5%) youth could not explain precisely when they encounter Nile perch for the first time in catches because most of them were born

around 1980s.

Table 1: Year of Nile Perch First Appearance in Catch (%)

Years	**Age cohort (years)**			
	18-35 (n=114)	**36-55 (n=113)**	**56+ (n=19)**	**Total (N=246)**
In 1980s	36.5	62.3	86.4	61.7
Do not know	63.5	37.7	13.6	38.3
Total	**100**	**100**	**100**	**100**

Source: Computed from Field Data (2012).

Other accounts show that Nile Perch was first encountered in catch as early as 1970s but in other areas it was noted in late 1960s. For example in Uganda, Pringle (2005) noted that Nile Perch was first hauled in 1962 and when it became locally named as Mputa and Mbuta in Luganda and Dholuo languages respectively. Other historical accounts (Ogutu-Ohwayo, 1990; Kaufman, 1992; Witte et al., 1992; Kaufman and Ochumba, 1993;) showed that Nile Perch (Latesniloticus) was introduced in Lake Victoria in 1954 by the British colonial government deliberately to boost fishery potential of the lake which was stagnating because of low economic value of the dominant haplochrominecichlid species. However, this shows existence of a variety of documentations on the exact year of Nile Perch stocking into Lake Victoria, which has brought a lot of misunderstanding between different fisheries authorities. A recent work by Downing et al. (2013) showed sequence of Nile Perch emergence in the three countries sharing Lake Victoria which suggests that each partner country sharing Lake Victoria experienced emergence of Nile Perch at different time intervals (Table 3).

Table 2: Emergence of Nile Perch in Fishermen's Catch

Year	**Event**	**Location**
1954	Illegal introduction of Nile Perch	Jinja, Uganda
1960	Catch of 8 Nile Perch between 28-43cm	Jinja, Uganda

	long	
1962-1963	Official introduction of 35 sub adults (16-43 cm) and 339 fingerling Nile Perch	Entebbe, Uganda
1963	Official introduction of 8 individuals (Size unknown)	Nyanza Gulf, Kenya
1979-1982-1983	Onset of Nile Perch boom	Kenya- Uganda-Tanzania
Until 1985	Catches of adult and sub adult Nile Perch	Mwanza, Tanzania
1986-1985-1987	Peak of Nile Perch boom	Kenya-Uganda-Tanzania
1981-1985	Final wave of Nile Perch boom	Kenya – Uganda
1983-1987	Final wave of Nile Perch boom	Tanzania

Source: Downing et al. (2013)

Despite the variation on records of Nile Perch stocking and its emergence in catch, earlier archaeological excavations showed presence of Nile Perch in Miocene deposits in Lake Victoria (Greenwood, 1953) which refuted claim of a kind of re-introduction of Nile Perch into Lake Victoria. Greenwood (1953) defended this by arguing that Miocene Nile Perch inhabited a totally different ecosystem which existed before formation of the present Lake Victoria basin.

3.3 Communities Reaction Towards Emergence of Nile Perch Catches

The initial reaction of fishing communities towards Nile Perch emergence in catch was full of dislike and apprehension. For example, during interview at Bwiro Island elders narrated that at first in early 1980s when Nile Perch first appeared in catch (locally named as mbuta or sangara), it attracted little market value because it was favoured by ordinary families which could not afford fish like Tilapia which fetched high market value. One elder was quoted saying;

"At very first time people were very suspicious about the Sangara, which delayed some people to eat sangara".

Another elder at Lukuba Island accounted that eating Nile Perch was associated with developing skin rashes or spots on body parts. In another interview a Village Executive Officer at Lukuba Island indicated that frequent eating of Nile Perch made people loose appetite because it is fatty. In other claim a group of elders at Mazinga Island asserted that people delayed taking Nile Perch as food because it was suspected of eating anything even corps of human being. In similar observation Geheb (1997) noted that in 1970s when genocides took place in Uganda and corpses being thrown into Kagera River which flows into Lake Victoria, there was a belief that Nile Perch were feeding on corpses. One elder was quoted recalling that;

"At one time Nile Perch was found with a wrist watch into its belly, suspected to be from a human hand".

The escalation of such claims curtailed consumption of Nile Perch to fishing communities and others around but with time as such assertions proved void, Nile Perch gained popularity in people's diet and assumed a higher market value.

3.4 The Boom Fishery of Nile Perch

The increase in total catch yield of Nile Perch and disappearance of native fish species were eminent in Lake Victoria by 1980s. Information from elders FGDs in this study justified the explosion of Nile Perch fishery by 1980s in all beaches in study area. Jansen (1997) indicated that by early 1990s a change in fishery pattern was eminent in all fishing communities characterized by influx of fishers into Nile Perch fishery. A similar trend of fishers' influx into Nile Perch fishery continued up to 2000s as reported by Warui (2007) with Tanzania showing highest number of fishermen across the three countries with highest increase of 75%, Uganda 55% and Kenya15% during the same period.

Findings of this study showed that apart from fishers who originated from fishing families, 36.5% of fishers comprised individuals originating from non-fishing communities in upland areas who joined into fishery sector during Nile Perch fishery. Fishery activities were the immediate activities that many thought to engage in due to its free access system and the remuneration it attracted. Other fishers originating from fishing communities indicated that,

because of Nile Perch abundances and its economic value they were motivated to abandon fishery of native fish species and turned to Nile Perch fishing. The other entrants comprised of retrenched civil servants who saw opportunity investing into fishery activities. Msambichakaet al. (1995) indicated that during Tanzania's Structural Adjustment Programme majority of retrenched employees were absorbed into different sectors of the economy. Some of respondents in this study were victims of retrenchment programme thus investment into fishing activities became their immediate option.

Amongst sampled fishermen, 46.0% indicated to have previously engaged into fishery of Tilapia, Sardine and other native fish species before 1980s. Because of lucrative earnings accrued from Nile Perch fishing, many of such fishermen turned into it. While about 23.4% of Sardine fishers indicated to had completely abandoned Sardine fishery because of Nile Perch fishery allurement, 47.2% indicated to have turned to Nile Perch fishery but still exercised some attachment to Sardine fishery.All interviewed fishers showed to have experienced the so called Nile Perch boom during the late 1980s and early 1990s. This was the period over which Madard (2001) indicated that, although in Tanzania Nile Perch fishery was already at pace, still principal buyers of fish from Mwanza and regions around were Kenyan importers who had already invested in equipments such as insulated collection trucks, ice, weighing scales and selectors at landing beaches.

The increase of Nile Perch catch yield in 1980s is numerously documented as unprecedented yield levels in fishery history of Lake Victoria which made it the most productive freshwater lake fishery in Africa (Abila et al., 2007; Gehebet al., 2007; Jansen, 1997; FAO, 2002). Statistics show that, Nile Perch landings alone in Tanzania part of the lake increased from 274 tonnes in 1981 to 120,000 tonnes in 1990 as indicated in Figure 2 which shows growth of fishery after introduction of Nile Perch. Similarly in other countries sharing Lake Victoria, a report from LVFO (2006) indicated an increase of total landings, for example total fish landings in Kenya increased from about 19,000 tonnes in 1977 to approximately 220,000 tonnes in 1992. In Uganda, total fish yield increased from about 11,000 tonnes in 1977 to 120,000 tonnes in early 1990s.

3.5 The Status of Declined Fisheries Resources in Lake Victoria

By end of 1990s, fishing communities in the study area had started experiencing remarkable changes in its fishery characterized by dwindling fish catch. The duration from 2000s was mentioned by majority of respondents as the duration when reduced earnings from fisheries was remarkably experienced. This represents multitude of people in fishing communities who were no longer able to access fish as food in their menu. This was evidenced by the respondents' fish consumption pattern whereby frequent consumption of vegetables and type of fish previously regarded inferior (Sardine) increased. Similar trends of declined fish catch particularly in Nile Perch fishery was reported in a Frame Survey carried out in 2005 by the Integrated Fisheries Management Programme (IFMP) whereby standing stock of Nile Perch was 623,000 tonnes with mean density of 11 tonnes per kilometre square. By 2006 the same survey recorded a drop to 571,000 tonnes at a mean density of 6.8 tonnes per square kilometre of water (Inigo, 2006).

To fishing communities in surveyed islands, the decline of fish catch resulted into reduced income earnings from fisheries activities which threatened survival to majority. To fishermen, the response was to increase fishing efforts that could enable them capture more fish to meet market demands and good prices offered by fish factory agents. About 31.3% of total fishermen in this study indicated to have invested more in fishing outfits changing from using manually paddled canoes to use of outboard motor engine boats which enable them travel far in following fish. For Nile Perch fishery, fishermen indicated to have modified fishing nets by lengthening their sizes capable to reach fish in deep waters.

The noted increase in fishing efforts was reported by fishermen in Focus Group Discussion at all surveyed islands to have initially accompanied by a gradual increase in fish catch yield from 2003 to 2005. Thereafter, low catch yield became order of the day despite sustained increased fishing efforts. Meanwhile, Taabu (2004) indicated an increased fishing efforts during 2003 to 2005 resulted into harvest peak at 327,000 tonnes but declined by 22% to 255,000 tonnes in 2006. This shows a remarkable decline of catch which did not match with the highest fishing efforts exercised by fishermen. Data in Figure 1 shows that Nile Perch catch yield for the three countries sharing Lake Victoria reached maximum between year 1987 and 1998. However because of the largest share in the Lake Victoria's water, Tanzania continued to experience

highest catch yield in most of that period despite having few number of motorised boats compared to Uganda. Warui (2007) principally attributed it to Uganda's efforts to increase fishing capacity through motorization of fishing boats whereas the country was estimated to comprise the highest proportion of motorized boats (50%) in Lake Victoria in the period 2000 to 2002.

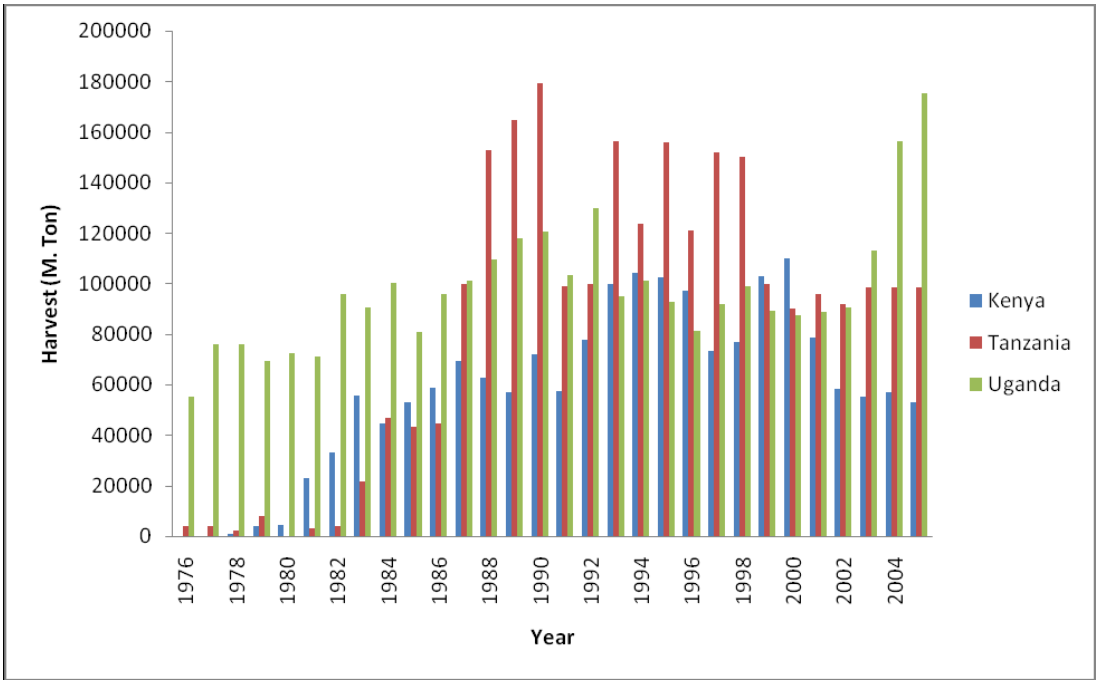

Figure 3: The Trends in Nile Perch Harvesting in Kenya, Uganda and Tanzania for the last 30 Years

Source: FAO (2008).

Similarly, majority of respondents (84.6%) accounted for declined landings up to mid-2000s despite apparent increase in harvest observed between 2003 and 2005. Figure 2 shows declined trend of fish catch yield amid increased number of fishing boats.

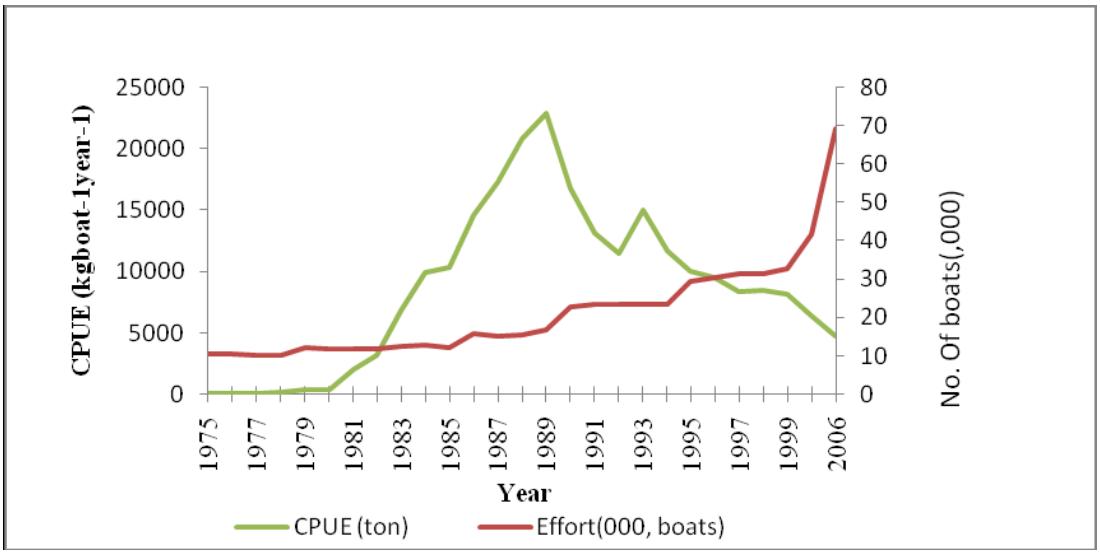

Figure4: The Nile Perch Catch per Unit Effort (CPUE) Trend with the Increasing Number of Fishing Boats

Source: Kyomuhendo (2005); LVFO (2007)

Besides of the noted remarkable increase of fishing efforts, it did not match with catch yield. In similar observation Njiruet al. (2008) accounted that, as the fishery demanded more fishing efforts, more fishers were recruited along with crafts doubling which was the cause for a sharp increase recorded between 2004 and 2006. This was further attributed to the high fish demands by fish filleting companies plus lack of jobs in other sectors. However, respondents in this study admitted for the re-appearance of fish species previously declared extinct from the fishery. This includes the previously dominant haplochromine species which is much favoured by Nile perch. The reappearance of haplochromine and other native fish species serve a vital role to livelihoods of fishing dependent communities which rely on fish catch as source of food and income. Therefore, its reappearance gives much relief to most riparian families.

4.0 Conclusion and Recommendations

For years Lake Victoria's fishery has served livelihoods to multitude of riparian communities. The emerged shift from artisanal to commercial fishery in the late 1980s brought significant fishery transformation along with changed mode of earning income. Declined fish catch along with overfishing have tended to characterise the current Lake Victoria's fishery. However, the diversity of historical accounts noted in this study reveals how important reliable information on

fishery transformation statistics are for future generation. During documentations review it was identified that Lake Victoria fishery faces contradictory fishery statistics whereas different scholars report different statistics on similar case. This suggests for strengthen cooperation and coordination with several organizations and agencies to harmonize statistics on Lake Victoria's fishery in order to minimize inadequacy and unreliability of data regarding fisheries. Such initiative will enable the lead organization such as LVFO to foster effective integration on fisheries management.Therefore, concerted efforts from different stakeholder are needed to compromise reliability and validity of the genesis and transformation of Lake Victoria's fishery. Otherwise, having different unreliable accounts tend to jeopardize any initiatives geared at revamping the fishery potential of Lake Victoria.

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