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Assessment of Small Scale Fishery in the South Western Lake Tana, Ethiopia

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By

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Submitted to A thesis presented in partial fulfillment of the requirements for the degree of master of science in Biology stream of Zoology.

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COLLEGE O SCIENCE

DEPATMENT O BIOLOGY

This is to certify that assessment of Small Scale Fishery in the South Western Lake Tana, Ethiopia By Ewunetu Meserte Kassie and an authentic work carried out under my guidance. The matter embodied in this project work has not been submitted earlier for award of any degree.

Name of Student _____ Signature _____ Date _____

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ABSTRACT

Catch data on the three commercially important fish groups (*Clarias gariepinus, Labeobarbu* spp. and *Oreochromis niloticus*) were studied in South Western part of Lake Tana at Kunzila landing site from October to April 2013. Fish were collected from my observation the fishing gear they used is monofilament gillnet of the fishermen organized into one fishermen Cooperative or association having36 members. They have 26 reed boats of which 7 were used to catch fishes at daily basis for five consecutive days every month. The total catch was 6188 of which 2147 (35 %), 2554 (41%), 1460 (24%) were from *Labeobarbus,* O niloticus, Cgariepinus respectively. The mean monthly abundance of *Labeobarbus* catch showed significant variation ($p < 0.05$). The peak abundance was during January. In this species the largest size fish catch was obtained during November and then the abundance onwards showed a continuous decline. Similarly abundance of *O. niloticus* (Tilapia) catch also showed significant temporal variation ($p < 0.05$). The peak abundance for Tilapia was observed during February followed by March. Of all the total African catfish (*C. gariepinus*) catch the highest abundance was recorded during March followed by April. Length-weight relationship of *Labeobarbus, was* curvilinear ($y=2.007x+0.250$) and was significant ($r^2=0.816$, $p<0.05$) with the regression equation fitted to the data collected. The length -weight relationship of NileTilapia was semi-curvilinear($y=0.082X+14.70X-125.6$) and significant ($r^2 = 0.770, P < 0.05$) with the regression equation fitted to the data of Nile Tilapia. The Length- weight relationship of African catfish was linear ($y=0.029X+0.576$) and significant ($r^2=0.703$, $P<0.05$) with the regression equation fitted to the data of African catfish. The overall production of the three species obtained was 14,434.1 kg (1.44 tonnes). A temporal distribution was studied through analysis of variance (one wayANOVA) of l catch data.

Keywords: Abundance, Clariasgariepinus, Labeobarbus Oreochromis O.niloticus, Stock assessment, Kunzila

Content **Page**

Content **Page**

LIST OF ABBREVIATION

FAO	food and agriculture organization
IRI	measure of relative abundance or commonness of specie
LTFRD	lake Tana fisheries resource development program
MSY	maximum sustainable yield
MT	metric ton
TW	total weight

APPROVAL SHEET

This thesis entitled assessment of small scale fishery in the south western lake tana (In case of kunzila landing site) by Ewunetu meseret has been evaluated by the board of examiners and was

accepted in partial fulfilment of the requirements of Degree of Masters of science in Biology stream of Zoology.

Approved by

Examining committee

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Chair person	Signature	date

Content ..... Page

1. INTRODUCTION

Fishing in Lake Tana started around 18th century, using papyrus reed boats (tankwa's), operated by the "Negada-Woyito" community and then the other poor members of the community

gradually adapted the activity (TesfayeWudeneh, 1998). Besides the reed boat fishery, seasonal fishermen which are farmers traditionally catch main *Labeobarbus* species on the upstream spawning grounds between July and October. These seasonal fishermen use a variety of fishing techniques like barriers, basket traps, hooks, scoop nets and even poisoning of the shallow water upstream using the dried and crushed seeds Birbirra tree (*Milletia ferruginea,*Leguminosae) (Nagelkerke and Sibbing, 1996)The three main species groups targeted by these fisheries are African catfish), Nile Tilapia) and *Labeobarbus* (de Graaf et al., 2006).

1.1 Statement of the problem

Kunzila is located at the gulf of Lake Tana to the South western in North Achefer is an area where commercially important fish catches C *gariepinus, L barbus*. and *O niloticus*) are experienced by a number of people living nearby the lake. Fishing in many part of Lake Tana is a part time job. The fishermen's' main job is crop and livestock farming using mainly fish traps, small gillnets. However most fishermen are non-licensed that may use illegal gillnet leading to the decline of fish stock resource.

According to commercial catch of *Laeobarbus* in Lake Tana at the end of the 19th(1987-1997) seems to increase six folds. However, over the last decades they have shapely decreased, due to mainly recruitment overfishing as a consequence of fish migration to their spawning rivers. (2012) based on the source of Bureau of Agriculture data reported the decline *Laeobarbus* _production in Lake Tana in the year 2012 compared to the catch of 2011. Similarly, in the same year the production for Nile Tilapia has decreased. Further the author reported a continuous decline in the production of catfish since 2010. Therefore, declining of commercial fish catch in Lake Tana is evident, Commercial fisheries data is scarce in the western part of the lake, especially in kunzila landing site. Hence, the present study is to collect baseline data on the status of the commercial fisheries in this landing site.

1.2 Significance of the study

Therefore this study will address the following research questions:

- What is the stock status of commercially important fish species kunzila landing site?
- What are the chief fishing gears that the fishermen use in the area?
- What is the fishermen income in Kunzila?
- What is the annual production of commercially important fish?

1.3 Objectives of the study

1.3.1 General Objective

The general objective of the study is to assess the stock status of commercially important fish groups in Lake Tana for wise use of the resource.

1.3.2 Specific Objectives are:

- To identify the most important commercial fish group(s) in the Kunzila landing site.
- To estimate the annual production in the Kunzila landing site.
- To estimate the fishermen income in the Kunzila landing site.
- To assess the market condition in the Kunzila landing sit
- To identify the size frequency distribution commercially most important fish group
  - T0 determine length-weight relationship commercially most important fish group

2. LITRATURE REVIEW

2.1 Life-history and vulnerability to fisheries

The susceptibility of fish species to human exploitation differs markedly. Generally, under prolonged and/or intensifying fishing pressure the composition of the catch in a multi-species fishery shifts towards the more resilient species of a fish community. In general, susceptible to fisheries are old segments of population of long-lived species, species with riverine migrations and spawning aggregations, and/or highly specialized endemics. Relatively unspecialized ecologically flexible species distributed widely in rivers and lakes, and adapted to fluctuating environments can be categorized as resilient. The most resilient fish are small sized species, like Limnothrissa(Clupeidae; Lake Tanganyika, Lake Kariba) or Rastrineobola(Cyprinidae; Lake Victoria), with high population turnover rates. Based on their ecology, reproductive biology and size/age characteristics *Labeobarbus, C.gariepinus*and *O.niloticus*can be placed on a scale from susceptible to resilient against increased fishing mortality.

2.2 *Labeobarbus*

Within Lake Tana's fish community the *L*.barbu sspecies are predicted to be by far the most susceptible to fisheries) as *Labeobarbus* are: (a) long-lived (TesfayWudneh, 1998), (b) form spawning aggregations), and (c) predominantly specialized endemics (Sibbing and Nagelkerke, 2001; de Graaf, 2003). Catch ability is highly variable during the year: CPUE peaked sharply in July, September and especially August in both periods and more than 50% of the annual *L .barbus* yield is landed during the 3 months of peak spawning, July–September, in 1992, 1993 and 2001. An overview of the ecological differentiation within the Lake Tana's *Labeobarbus* (Source: de Graafet al., 2006).tributary river mouths such as Gumara, Ribb, Megech, GelgelAbbay and Dirma Rivers before migrating upstream to spawn on the shallow, gravel bedded and fast flowing Wassie Anteneh et al., 2008). The fishermen clearly target these spawning aggregations. A sharp decrease in abundance by ca. 75% of the migratory riverine spawning*Labeobarbus* species in the sub littoral and pelagic zones of the lake, areas where no fishing takes place and the collapse of juvenile *Labeobarbus* (between 5 and 18 cm FL: by 90%) during the 1990s suggest recruitment-overfishing (de Graafet al., 2006), i.e. a disturbance of the reproductive process resulting in a dramatic decrease in the number of recruits (Craig, 1992). This sharp reduction in abundance of *Labeobarbus* in the sub littoral-pelagic area of the lake is

not caused by direct fishing effort (1% in 1991–1993, 0% in 1999 2001) in these habitats but is likely the result of over-exploitation of the spawning aggregation in the river mouths (de Graafet al., 2006). The most probable explanation for the decrease of these Labeobarbus species in the middle of the Bahiar Dar Gulf, is fishing mortality during their migration and aggregation in theGumara, Gelda and Ribb Rivers, The drastic reduction in *Labeobarbus* along the whole north-eastern shore of the lake as shown by the fishery dependent data (experimental trawl) seems to point towards a reduction in Lake Tana's *Labeobarubs* on a much larger scale than just the BahirDar Gulf.

The selective impact of the gillnet fishery on especially the riverine spawning *Labeobarbusspecies* is further illustrated by the sharp decrease in *Lbeobarbus* thesub littoral and pelagic areas compared with the littoral area. Lacustrine spawning *Labeobarbus* species occur predominantly in the littoral areas of the lake while the riverine spawning *Labeobarbus* species are restricted to the sub littoral and pelagic areas (de Graaf, 2003; de Graafet al., 2005). The sharp decrease of *Labeobarbus* is unlikely to have been caused by environmental change as was shown by de Graafet al. (2004). The decrease is also unlikely to be the result of fishing effort from the traditional reed boat fishery and/or seasonal fishing by farmers on the upstream spawning areas. The reed boat fishery has not increased in effort during the last decade and the number of boats remained stable (until 2001). The subsistence fishermen mainly catch *O. niloticus*in the shore areas and do not target the aggregating *Labeobarbus* in the distant river mouths (TesfayWudneh, 1998)

2.3 African catfish

*Claries gariepinus*is an ecologically flexible species.It has a broad diet spectrum and occupies habitats ranging from the offshore to the littoral areas in the lake, to floodplains and to river channels 40 km upstream (TesfayWudneh, 1998; Palstraet al., 2004). Catch ability of C. ga*riepinus*changes throughout the year. During the dry season (December–May) the benthic *C. Gariepinus is* most common in the sub littoral and offshore areas of the lake. Landings of *C. Gariepinus* are low during this period as the commercial gillnet fishery operates only in the littoral areas. At the start of the rainy season, C.gariepinus moves through the littoral areas towards the inundated floodplains and upstream inflowing rivers to spawn in June–July. While the Gumara with its upstream oxygen-rich shallow gravel beds is used by *L.barbus* as a spawning area, *C.gariepinus is by* for the dominant species upstream the turbid Ribb River with

its extended marginal floodplains and lower aquatic oxygen content (Palstraet al., 2004). When the water level starts to decrease (October–December) C.gariepinus migrates back through the littoral zone towards the sub littoral and pelagicareas. *C.gariepinus is* intercepted by the commercial gillnet fishery when migrating between the floodplains (spawning areas) and the sub littoral-pelagic areas.CPUE of *C.gariepinus* of both the commercial gillnet fishery and the experimental trawl program decreased sharply in the BahirDar Gulf during the 1990s However, the decrease did not occur equally over the whole fish size. Especially the more susceptible older and larger (>50 cm TL) individuals decreased in the trawl catches between 1991 and 2001. Although the large, older individuals proved to be vulnerable for increased mortality by the commercial gillnet fishery, it is expected that, compared with *Labeobarbus, C.gariepinu s*is only moderately susceptible to future fishing pressure. Furthermore, because of the low monetary value and appreciation of this species by the Ethiopians, *C. gariepinus*is not specifically targeted by the commercial gillnet fishery and is mainly landed as by catch

2.4 Nile tilapia

To compared *Labeobarbus* spp. and *C.gariepinus, O.niloticusis* expected to be the most resilient against increased mortality induced by the motorized gillnet fishery. Catch ability of *O. Niloticus* is varies and highly correlated with seasonal changes in water level. CPUE decreased significantly just after the start of the rainy season from July–August to November–December when water levels are high. During high water levels, *O.niloticus* migrates towards the relatively safe inundated floodplains where the commercial gillnet fishery has no access . *O .niloticus has* no well-defined breeding period and ripe fish can be found throughout the year (ZenebTaddesse, 1997). Their reproductive strategy is rather specialized being mouth brooders with a high investment in parental care. The high potential for reproductive success of *O.niloticus*is further caused by its wide habitat tolerance for spawning and nursery purposes and flexibility in size at maturity.

3. MATERIALS AND METHODS

3.1 Description of the study area

The former AcheferWorda, located in West Gojjam Zone. is divided into South Achefer and Achefer Worda's, North Achefer is adjacent to Lake Tana in the south west part where the small town named Kunzila is located According to the population and housing census of Ethiopia (2007) the population of North Achefer recorded were 21051, of which 9759 are males and 11295 are females. Among these human population 4490 are urban dwellers whereas the others are living in rural area. Kunzila is commercially fish landing site at western part of LakeTana

The lake area under study in this research covers the south- Western part of the Lake Tana, around Kunzila North Achefer Woreda is one of the specific words in West Gojjam Zone.from these particular woreda there are 24 kebeles, of these three are urban kebeles from these kunzila is the target of the study .which is the border of South Western part of the lake. It is near to Tana Belles multipurpose project hydro-power dam

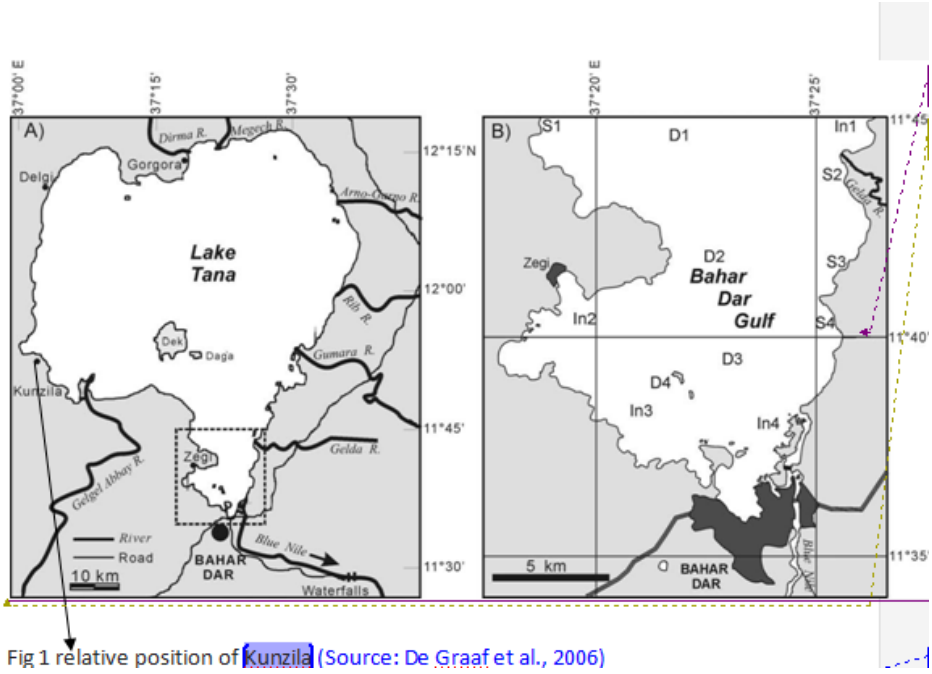


Fig 1 relative position of Kunzila (Source: De Graaf et al., 2006)

3.2 Data collection

data were collected at a landing site from seven licensed fisher men per a month from October 2013 – April 2014 by recording total catch, weight average price per kilogram length and arranging the length frequency of each species based on size category. Another ways used to collect data was questionnaires to justify income of fishermen and market integration. To analysis length frequency the data was categorized in to three groups for both fish species individual for *Labeobarbus* 40cm -64cm (longer sized), 30cm – 39cm (Medium sized) and 20cm – 29cm(Smaller sized). Regards to Nile Tilapia 28cm -35m (longer sized). 22cm – 27cm (medium sized) and 16cm – 21cm (Smaller sized). For African cat fish 40cm -65cm (longer sized), 30cm – 39cm (Medium sized), 20cm – 29cm (Smaller sized) was classified. Materials used to collect data were ruler spring balance, paper, pen seven reed boats of fishermen used per a day from the total of 26 13 mono filament gillnets Constantly in a trip with stretch Mesh size 8 -12Cm. the time of gillnet setting during the morning (12:00 Local time) and lifted the following morning constantly, the number of trip of fish in was one times in 24hours. The total no of fisher men were 36 of them 26were males the rest were females and they participate in fish processing rather seven males engaged for fishing in each day.

3.3 Data analysis

Data was gathered from kunzila landing site through questionnaires from licensed fisher men and interprated .A temporal pattern was studied through analysis of variance (one wayANOVA) of lo catch data. The relationship between total length and total weight of most dominant fish was calculated following power function as in Bagenal and Tesch (1978) procedures $TW = aTL^b$ or $\ln TW = \ln (aTWL^b)$ or$\ln (W) = \ln (a) + \ln (b)$ Where: TW – total weight (gm), TL- total length (cm), a-intercept of regression, b-slope of Regression line). Income of fishermen was treated by questionnaires interpretation.

4. RESULTS

4.1Abundance

The total 6188 specimens, belonging to the three commercially important fishes *(L.barbus, O. niloticus* and *C. gariepinus)* were recorded in the study period. As showed in (Table 1) the lowest catch of *Labeobarbus* was recorded during April but January contributes a lot. The abundance of Nile Tilapia was high during February and catch Zero from October up to January but catch of African cat fish was zero from November February in the opposite the peak catch was recorded during march.

The total abundance of *Labeobarbus* recorded from October to April was 2174. Monthly contribution for October, November, December, January, February, March and April recorded 282,351,388,519,302,250 and 80 respectively (Fig 2). The highest catch obtained during January (519) followed by December (388) and the least was recorded during April (80). For September to April.

The total abundance of *C. gariepinus* recorded from October, March and April was 1460. Monthly contribution for October, March and April recorded 477, 493 and 490 respectively (Table1)

Table 1 Monthly Catch of commercial fish

Species	October	November	December	January	February	March	April	Total Catch	Cat inn
Labeo barbus	287	351	388	519	302	250	80	2174	
Nile tilapa	-	-	-	-	1230	735	589	2554	
African Cat fish	477	-	-	-	-	493	490	1460	

4.2 Monthly price of fish in birr per kilo gram

The other hand the lowest fish price was recorded during November. The price of Nile Tilapia never show significant Variation of fish price among the cached month and African cat fish also nearly As showed in (Table2) monthly fish price of *L. barbus* was peak during January in show similar character in price of fishing to Nile Tilapia.

Table2 Monthly price of fish in birr per kilo gram

Species	October	November	December	January	February	March	April
Labeo barbus	17.3±1.7	15.5±3.3	18.1±0.5	18.8±1.3	17±0.9	17.9±1	18.4±1.9
Nile tilapa	-	-	-	-	18.2±3.5	18.3±3.4	18.3±3.3
African Cat fish	6.5±0.6					6±0.4	6±0.5

4.3 Size frequency Monthly Catch of commercial fish

The highest number of bigger *L.barbus* (larger) size fishes were (64cm) recorded in November followed by October and showed a decline trend from December onwards. The highest number of medium sized fishes (44cm) was recorded during November followed by a slight difference in December then after showed a continuous decline trend towards January up to April (Fig 2).The highest number of small sized fishes (27cm) was recorded during January followed by December and February. The least number of small sized fishes were trapped during April. For *o. niloticus*). The highest number of bigger (larger) size fishes (65cm) was recorded in April followed by Octoberl and then in March. The highest number of medium sized fishes (35cm) was recorded during October). Clarias gariepinusThe highest catch obtained during March (493) followed by April (490) and the least was recorded during October (477 followed by April and then in March (Fig 4).The highest number of small sized fishes (25cm) was recorded during March followed by April and then in October

Fig 2 Monthly size frequency variation of s *Labeobarbus* pp. at Kunzila landing site

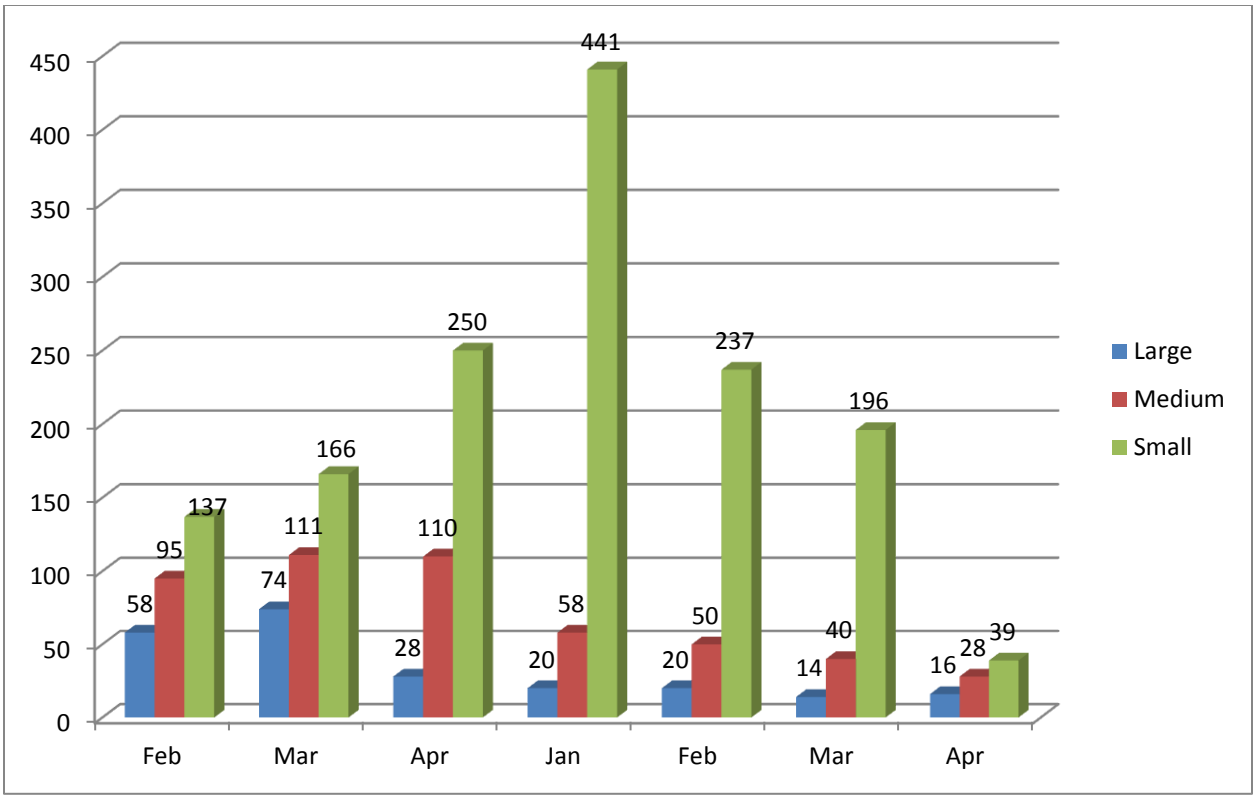


Fig 2 Monthly size frequency variation of Labeobarbus spp. at Kunzila landing site

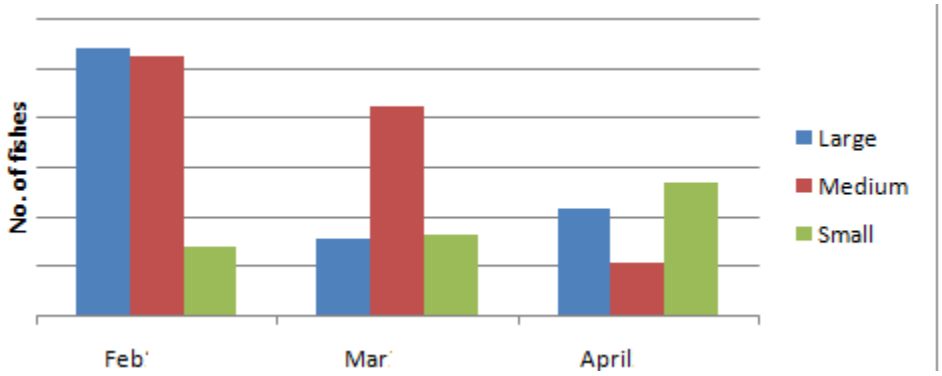


Fig 3. Monthly size frequency variation of Oreochromis niloticus at Kunzila landing site

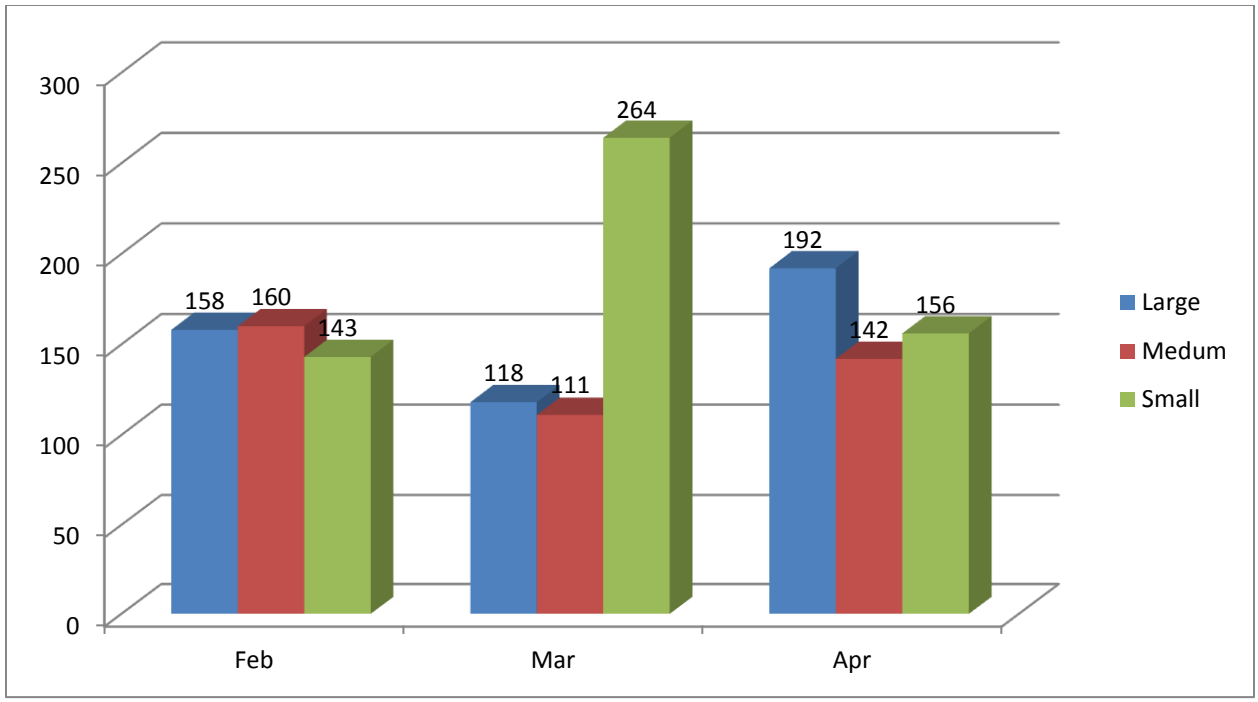


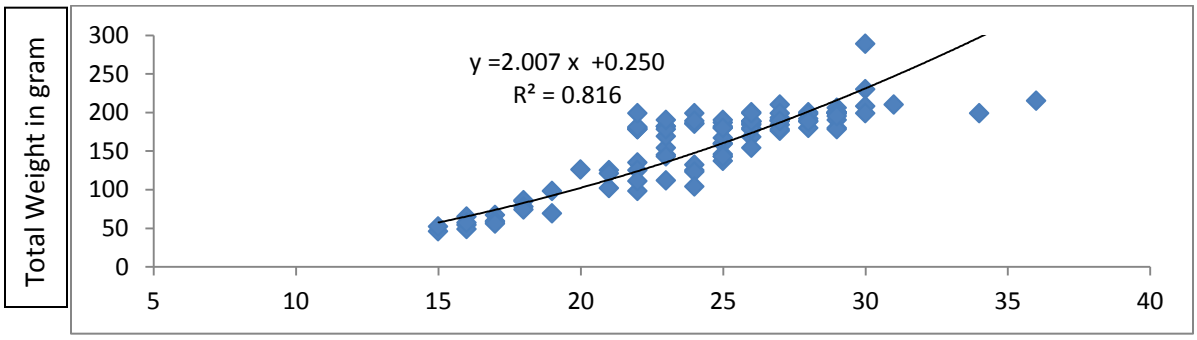
Fig 4 .Monthly size frequency variation of Clarias gariepinus by sizeat Kunzila

4.4 Length weight relationship

(r^2=0.816, p<0.05) with the regression equation fitted to the data of Labeobarbus (Fig5).

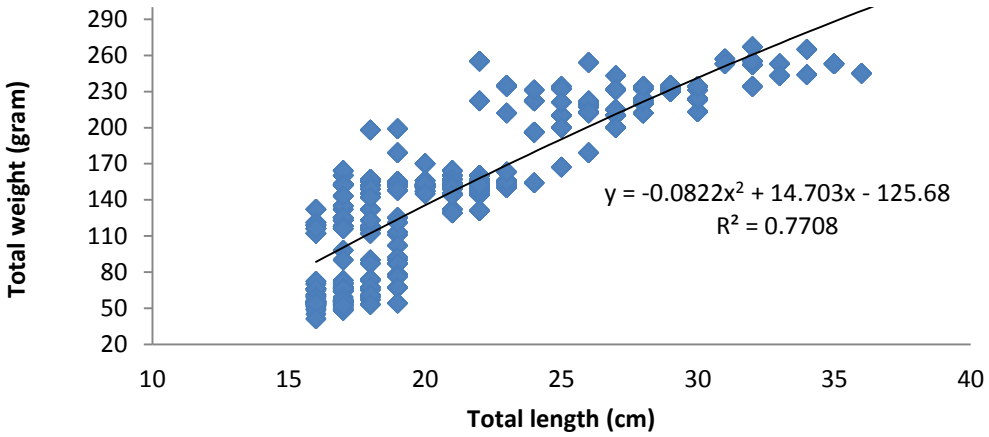
The length weight relationship of Niletilapia was semi-curvilinear and significant ($r^2 = 0.770, P < 0.05$). the regression equation fitted to the data of Niletilapia (Fig6).

The Length weight relationship of African catfish was linear and significant(r^2=0.703, P<0.05) the regression equation fitted to the data of African (Fig7)

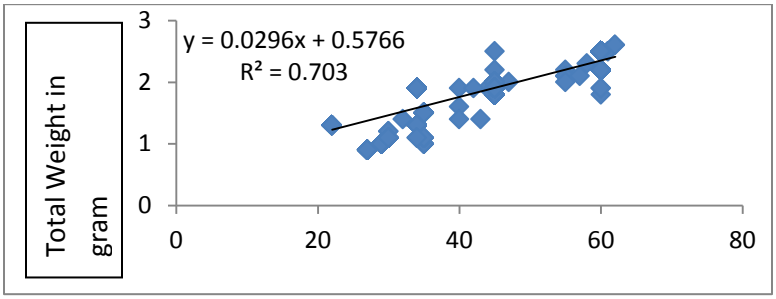


Total length (cm.)

Fig.5 Length weight relationship of *Labeobarbus*



F ig. 6 Length weight relationship of Tilapia.



Length (cm

Fig.7 Length weight relationship of African catfish

4.5Opinion of fishers on production

The overall high (38.9%) commercial fish production was described by the respondents from September to October followed by November to December (27.8%) and the least amount was from January to February (Table 1). Based on the response of respondents the most convenient month for Nile tilapia production was from March to April (38.9%) followed by January to February (27.8%) whereas the highest (33.3%) amount for *Labeobarbus* was from September to October followed by November to December (27.8%). In this species the least was recorded from March to April (5.6%). Fishing in the study area is a secondary activity next to farming for fisher men then the monthly income of each fisher men from fish selling varies seasonally based on abundance of fish however the highest income was 850Birr in the dry season but 1400Birr in rainy season.

The market integration of fish is not attractive to the fishermen because there were illegal civil merchants transport dry fish to Sudan through Delego main road in addition the fisher men used mono filament gillnets with different mesh size in different days for their personal advantage.

Catfish……

Table.3. response of fishermen

Item	No. of respondents	Month	No. response	Response%
In which season is Fish product high?	36	September-October	14	38.9
		November-December	10	27.8
		January-February	-	-
		March April	5	13.9
		May-June	7	19.4
Which season is much convenient to Nile tilapia production	36	September-October	-	-
		November-December	3	8.3
		January-February	10	27.8
		March April	14	38.9
		May-June	9	25
In which season is much convenient to *Labeobarbus* production	36	September-October	12	33.3
		November-December	10	27.8
		January-February	8	22.2
		March April	2	5.6
		May-June	-	-
In which season is much convenient to A production	36	September-October		
		November-December		
		January-February		

frican catfish		March April		
		May-June		
In which months were obtained high price of fish	36	September-October	20	55.6
		November-December	16	44.4
		January-February		
		March April		
		May-June		

5. DISCUSSION

Regards to monthly catch of *Labeobarbus* the only significant is the catch of January. The reaming has no significant Variation. The overall production of the three species obtained was 14,434.1 kg (1.44 tonnes) . According to AbebeAmeha and AssefaTesse (2002) the number of fish sold on the local markets by these seasonal fishermen fluctuated between 2 MT (1992, 1998) and 11–19 MT in 1993 and 1994, respectively Tana's fish community the *L.barbus* species are predicted to be by far the most susceptible to fisherie) as the *Labeobarbus* are: (a) long-lived (TesfayWudneh, 1998), (b) form spawning aggregations (Nagelkerke and Sibbing, 1996; de Graafet al., 2005; Wassie Antenehet al., 2008), and predominantly specialised end(Sibbing and Nagelkerke, 2001; de Graaf, 2003). Catch ability is highly variable during the year: CPUE peaked sharply in July, September and especially August in both periods and more than 50% of the annual *Labeobarbus* yield is landed during the 3 months of peak spawning, July–September, in 1992, 1993 and 2001.The drastic reduction in *Labeobarbus* along the whole north-eastern shore of the lake as shown by the fishery dependent data (experimental trawl) seems to point towards a reduction in Lake Tana's on a much *Labeobarbus* h larger scale than just the Bahar Dar Gulf.The selective impact of the gillnet fishery on especially the riverine spawning pecies is *Labeobarbus* further illustrated by the sharp decrease in *in* the subli *Labeobarbus* ttoral and pelagic. But catch ablity highly available during Julay ,september secially august (Sibbing and Negekerke,2001.,Tesfay Wudeneh ,1898) cach of large *Labeobarbus* . *Labeobarbus* in lake Tana initially (1987-1997) increased six fold (Tesfay Wudeneh ,1998) however for the last decays dcreased over fishing during fish migration (Tesfay Wudeneh ,1998,deGraaf ,tel,el2004).Variation of fish abundance recorded during February significantly different from March, April and Vies Verse in Multiple compressions for Nile Tilapia and catch from October up to Juan vary.

Variation of African cat fish a catch never show a significant variation and no catch from November up to February. . African cat fish catch ablity is low in landings in dray seasons (Decmber-May) because to the opposite in June -Julay catch ability is high (Tesfay Wudeneh ,1998 . specially the older and larger (>50 cmTL)but not ocure over the whole size however there were individual decrease between 1991 and 2001

In relation to size of the maximum *Labeobarbus* length (43.5Cm) was recorded at a month of November that means there was less exploitation of small and medium sized fish. However at a

month April both fish sized catch show a little Variation in abundance. In the other hand there were high exploitation of small sized fish in January and the smallest fish sized (20cm) recorded in March.

Regards Nile Tilapia the maximum length was recorded during February which Mean small sized fish were unexploited,. In the opposite during April there was high exploitation of small sized fishes. To the other side medium sized fish were highly exploited during February followed by March. During 1990s(FL50%,18.1cmTL in 1991-1993) high (Tesfay Wudeneh ,1998),FL50% 17.6cmTL (deGraafetal,2003 and FL50%is well below the average siye at harvest 26cmTL) (Tesfay Wudeneh ,1998) .in Bahir dar gulf the abundance of both in number and weight did not decrease significantily the 1990s although the number of large specimen (>20cmTLdecreased)but the number of small individual increased. The variation of cat fish by size was recorded in October the longest fish were recorded next to the medium sized but the smaller fish were less dominant. The opposite is true to march. But larger sized cat fish were dominant in number during April followed by small sized once. C.gariepinus migrates back through the littoral zone towards the sub littoral and pelagic areas. Clariasgariepinusis intercepted by the commercial gillnet fishery when migrating between the floodplains (spawning areas) and the sub littoral-pelagic areas. The CPUE of C. gariepinus of both the commercial gillnet fishery and the experimental trawl program decreased sharply in the BahirDar Gulf during the 1990s (de Graafet al., 2006). However, the decrease did not occur equally over the whole.

The overall high (38.9%) commercial fish production was described by the respondents from September to October followed by November to December (27.8%) and the least amount was from January to February (Table 1). Based on the response of respondents the most convenient month for Nile tilapia production was from March to April (38.9%) followed by January to February (27.8%) whereas the highest (33.3%) amount for ***Labeobarbus*** was from September to October followed by November to December (27.8%). In this species the least was recorded from March to April (5.6%).

Monthly price of *Labeobarbus* show a significant ($P< 0.05$) different from each other in all seven months in multiple compression (Table2).Variation of fish price for Nile Tilapia recorded in all months was not significantly deferent from each other between months (Table2).Variation of fish price for African cat fish was significantly different from each other in multiple compressions (b/n Months)

Income of fishermen and marketing status, as I observed and interviewed the fish was available in the market fresh with no any treatment and dry fish form. The government support the fisherman by giving license and materials such as 18boxs to transport fish from the port to their office, two refrigerator but which are non functional until the end of data collection, two tables for fish dissecting and a geomembrane for fish drying.

Fishing in the study area is a secondary activity next to farming for fisher men then the monthly income of each fisher men from fish selling varies seasonally based on abundance of fish however the highest income was 850Birr in the dry season but 1400Birr in rainy season.

The market integration of fish is not attractive to the fishermen because there were illegal civil merchants transport dry fish to Sudan through Delego main road in addition the fisher men used mono filament gillnets with different mesh size in different days for their personal advantage.

Length weight Relation of *Labeobarbus* show isometric growth which that weight increases at a rate of about a cub of increase in length with the regression coefficient for most dominant species were b=3 (Demeke Admass 1990) and wassie Antench 2005 in megech and Dirma rivers. The length weight relationship of Tilapia was semi curvier near. But the length weight relationship of cat fish showed linear regression.

6. Conclusion

The lowest catch of ***Labeobarbus*** was recorded durin***g*** April but January contributes a lot. The abundance of Nile Tilapia was high during February and catch Zero from October up to January but catch of African cat fish was zero from November February in the opposite the peak catch was recorded during march.

The three commercially important fish group sknown as , *O.niloticu s*and*C.g* ***Labeobarbus*** *ariepinus*were studied at Kunzila landing site from October 2013 to April2014inorder to assess the statusof stock as to utilize wisely and manage the resource properly. The Thus all of the fish group show temporal varection of in catch between months, as Interviews The Maximum abundance of commercial fishery was observed during wet season showing adeelino in dry season (*L.barbus*) .In terms of catch Nile Tilapia was the most dominant followed by and ***Labeobarbus*** African cat fish (2554,2174 , 1460) respectively .Not only this Commercially important fish group also show varection in production (6.712,0.302,0.018)tones to NileTilapia ***Labeobarbus*** and African cat fish.-In the view of fish exploitation ***Labeobarbus*** was highly

exploited but Nile Tilapia was slightly exploited to the contrary African catfish was less affected to exploitation .The income gaind from fish sale highly correlated to fish production. However NileTilapia was cost in price follow ***Labeobarbus*** and African cat fish in fact the highest income of fish ermen gained from fish sailing 1400 Birr during rainy season, in the opposite lowest income was gaind 850 Ethiopian Birr during the dry season. The Market and fish resource association of the fish as I observed and interviewed done by illegal exporters to sudan (non licensed civil Merchants.) -Based on the results of this study it is also conclude that fisher Men use poly filament gillnets related to this ***Labeobarbus*** fish species need a great attention for future exploitation.-In the study area the society commonly use Nile Tilapia for feeding even if it is cost but rarely they used African cat fish next to ***Labeobarbus***

7. Recommendation

- There is no any measure action taken to non licensed fisher men they use illegal gillnet.
- There must be awareness creation about fishing and market integration.
- There is no well awareness about catfish usability as food.

The impact of gillnet

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9. APPENDICES

Appendices A የፅሁፍ መጠይቅ

ውድ የጥናቱ ተሳታፊዎች

የዚህ ጥናት ዋና አላማ በቁንዝላ አካባቢ ለገበያ የማቅረቡ የአሣ ነባሪዎች ያሉበትን ሁኔታ ለማወቅ ለማድርገው ጥናትና ርዕርስዎ የምንሰጥዋትን መጠይቅ እንዲሚሉልን ፈቃደኛ በመሆንዎት እያመሰገንን መጠይቁን ከ1/5/2006 -1/6/2006/ ሞልተው በመስጠት ለአሣ ሀብቱ እድገት የበኩልዋን ድርሻ እንደወጡ እየጠየቅን

የሚሠጡተን መልስ ከአጥኝው በስተቀር የሚያየው የለም

መጠይቁን ሲሞሉ ስም መፃፍ አያስፈልግም

በተሠጠው ሳጥን ውስጥ (X) መልከታ ያስቀምጡ

	የፅሁፍ መጠይቅ	ወራቶች	የምርጫ ሳጥን (ከሚመርጡጥ ሳጥን (X) ያስቀምጡ
1	ከሚከተሉት ወራቶች ውስጥ የተሸለ ያሳምርት በየጥኞች ውስጥ ይሠባሰባል	መስከረም - ጥቅምት	
		ከታህሳስ - ህዳር	
		ከታህሳስ - ጥር	
		ከየካቲት - መጋቢት	
2	ከፍተኛ የዓሳ ሽያጭ ገንዘብ የሚገኝባቸው ወሮች	መስከረም - ጥቅምት	
		ከታህሳስ - ህዳር	
		ከታህሳስ - ጥር	
		ከየካቲት - መጋቢት	
3	ለቁርስ ምርት ምቹ የሆኑ ወሮች	መስከረም - ጥቅምት	
		ከታህሳስ - ህዳር	
		ከታህሳስ - ጥር	
		ከየካቲት - መጋቢት	
4	ለነጭ አሳ መርት ተስማሚ የሆኑ ወሮች	መስከረም -	

		ጥቅምት	
		ከታህሳስ - ህዳር	
		ከታህሳስ - ጥር	
		ከየካቲት - መጋቢት	
5	አንባዛ /ቀይ/ አሳ ምቹ የሆኑ ወሮች	መስከረም - ጥቅምት	
		ከታህሳስ - ህዳር	
		ከታህሳስ - ጥር	
		ከየካቲት - መጋቢት	

appendices B ሙጢይቅ 2

ተ.ቁ	የመጠይቅ ዓይነት	ቁርስ የምትሉ ከዚህ መጠይቅ ፊት ስያደርጉ	ነጭ አሳ የምትሉ ከቀጭ አሳ ስር(X)	አምባዛ የምትሉ ከዙህ ሰንጠረዥ ስር(X) ያስቀምጡ
1	በዋነኛነት ለምግብነት የሚያገለግሉ የዐሳ ዝርያ			
2	አልፎአልፎ ለምግብነት የሚያገለግሉ የአሳ ዝርያ			
3	በጣም በትንሹ ለምግብነት የሚያገለግሉ የአሳ ዝርያ			
4	በከፍተኛ ዋጋ የሚሸጡ የዓሳ ዝርያ			
5	በቁጥር የተሸሉ የኣሳ ዝርያ			

Appendices C table.1descriptive analysis of commercial fish

Variable	*labeobarbus*	Tilapia	Catfish
	mean	Mean	Mean
abundance	62.5 ±5.18	166.8667 ±18.33	84.8±7.575
Weight	1462.49 ±10.24	167.855±1.373	1.8186±0.165
Length	406.62 ±2.35 in cm	22.47±0.7886	46.177±0.3262cm
Price	25.78 ±8.75	2.995±0.41	10.8257±0.9583

Appendices D analysis of anova

Variable	Labeoborbus		Tilapia		Cat fish	
	F	Sig	F	Sig	F	Sig
Abundance	9.459	.000	7.713	0,007	2.66	0.110
Length total	54.852	.000	349.75	.000	4.648	0.010
Total weigh	65.145	.00.	83.135	.000	1.429	0.240
Total price	-	-	34.352	000	1.243	0.289

10. BIOGRAPHIC SKETCH

The author was born in Amhara Region, West Gojjam zone, and south AcheferWoreda in1975.He has learned his primary class in ayalew mekonenn and high school in Merawi secondary school and I have completed here in1993 E.C. He has a BE degree in biology in Bahirdar university in 2002E.C .After graduation I employed in south Achefer Woreda and he has been serving a cluster supervisor .