

Problems and Prospects of Inland Water Fishing in Malawi (5): Cases of Lungazi and Chinguma ~ Eastern Shore of the Lake Chilwa~

今井 一郎
Imai Ichiro

This paper explores the economic and political dimensions of fishing activities conducted on the Lake Chilwa, Malawi, based on data obtained by the author during field researches in 2007, 2015 and 2019. It first gives an outline the results of earlier research carried out by the author in the Bangweulu Swamps, Zambia in 1983, 1985, 1990 and 1994. Among the Bangweulu fishers, the fishing methods and fishing seasons differ from one ethnic group to the next, resulting in each group mainly catching a different type of fish. For this reason, there is little friction among the groups concerning fishing rights in the area. Next, a summary of fishing activities on the Lake Chilwa is given, with reference to earlier studies that fishing activities were conducted in a way that was harmonious with the environment. It also gives the results of research conducted by the author in 2015 and 2019 in contrast to the data which was obtained in the research of 2007. These researches were carried out at Lungazi and Chinguma beaches which are situated in the eastern shore of the lake. It shows the outline of a future research in the Lake.

Key Words : Lake Chilwa, Swamp Fishing, Aquatic Resources, Conservation,
Control of Fishing, Indigenous Knowledge

1. Introduction

Fish species of rivers, lakes and marshes in tropical area of the African continent occupy an important position in the people's diet which is rich in animal protein. It is gathered from the ancient sites around the Lake Malawi that an unique fishing culture has been nurtured in Malawi (Kada,1998). Several literatures show the fact that the Bangweulu Swamps and the Lake Nyasa (present Lake Malawi) were important areas which supplied with fish meat to the mine workers and city population in Northern Rhodesia (Zambia) and Nyasaland (Malawi) (Brelsford,1946). The system of fish consumption and circulation has been kept up until now. In fact, governments of south-eastern inland African countries, such as Zambia, Malawi and Zimbabwe keep

its own organizations which supervise the fishing activities and resource management.

As I mentioned in the previous research report (2015), several researches were carried out from the points of ethnology, human geography, environmental sociology and so on (i.e. Ankei1982, Kada1998, Kada, Nakayama and Malekano2002, Ichikawa1995). I myself have carried out field researches of the fishing activities in the Bangweulu Swamps, Zambia from the point of ecological anthropology since 1983 (Imai1985, 1986, 1987, 1991, 1998, 1999, 2000, 2008). The results of our research, it is clarified that the local residents of the Bangweulu Swamps make their living by catching fish in the swamps for putting them on the market, while they make use the fish resources sustainably (Imai 1985, 1986, 1987, Ichikawa 1985). It is clear

from the above that most of the fishers, composed of several ethnic groups, were part-time fishers who also engage in cultivation as same as fishing. It is also clarified how the swamp area is actually utilized by the several ethnic groups from different areas (Imai 1985,1986,1987, Ichikawa 1985).

According to Imai (1986), most of the swamp fishers, composed of several ethnic groups, were in fact, part-time fishers who also engage in cultivation. I also found that each production unit chose a specific fishing method to catch a particular group of fish, for example, the Mormyridae or Cichlidae, in high demand in the markets. He also found that the types of fishing activity among the fishers were divided into three classes on the basis of fishing seasons, fishing grounds and methods, and furthermore, that the swamp area was actually utilized by the several ethnic groups from different areas (Imai, 1986,1987). Accordingly, condition of resource shortage or environmental destruction have been avoided through this indigenous pattern of management without any legal or administrative controls.

In a previous paper (1985:87), I reported that Zambian fishing co-operatives decided on a fixed price for fish in each area, and that local people observed the price in their economic transactions. Under this arrangement, fishers sold their dried fish to traders at a fixed price per kilogram, regardless of fish species. That is to say, fish in the swamps fluctuate with the annual rise and fall of water level, distribution of foods and the condition of breeding habits. So that the fishers and the fish traders cannot get their wishful fish species invariably.

It can be interpreted that the fishers prefer to get much profit by selling fish per weight than selling high-priced fish species (Imai,1991). In essence, the fishers were able to sell any species of fish at a fixed price regardless of the price in the urban markets. Imai (1998:84-85) highly appreciates the indigenous knowledge from the point of sustainability of fishing in the inland water area.

Based on my research experiences of the Bangweulu Swamps in northern Zambia, I have conducted the field researches about fishing activities in the swamp areas of the Lake Chilwa and the Lower Shire River, Malawi. Lake Chilwa has an area up to 18,000 km², which is located in the inland basin, south-eastern area of Malawi(Fig.1,2). It is a shallow lake on the border between Malawi and

Mozambique in the south-eastern part of the African continent; 622m above sea level. According to the field researches by the author, it is cleared that effect of market economy has penetrated into the fishing activity among the fishers of the Lake Chilwa. So that the real situation of the fishing activity has to be clarified more than before. This article pays attention to the fishing activities in the eastern part of the Lake Chilwa, and reveals the recent change and problems which have resulted in the fishing activity. This article also gives assignments for sustainability of fishing in the area. Materials of the article were collected in the field researches which were carried out around the south-eastern shore (Lungazi) and north-eastern shore (Chinguma) of the Lake Chilwa in 2015 and 2019.

2. Water Resource Management in Malawi

Because amount of fish catch from the Lake Chilwa is much less than that in the Lake Malawi, it is widely appreciated that the economic importance of the Lake Chilwa is not higher than that of the Lake Malawi. In addition to that, number of the fisher from the other area is quite small, because a lot of Anopheres mosquitos which carries malaria disease inhabit in the lake and the swamps. However, it has been made clear that fish catch from the Lake Chilwa water area has been circulated in the fish market of the big neighboring cities such as Blantyre and Zomba in these days (Imai 2005,2007,2013,2015,2017,2019). According to the statistical records by the Government of Malawi, production of fish in several fisheries of the Lake Chilwa and the Lower Shire River which is considered as minor fisheries in Malawi has been an increase recently (Fisheries Department, 1994).

Activity of fishing in the large water area such as the Lake Malawi has become on a large scale in accordance with the increase of fish demand in the urban cities in Malawi. At the same time, it is pointed out that total amount of fish catch has stopped increasing and size of fish caught has downsized in these days (Mususa,2004). In the previous report (Imai,2005), I insisted that a long term vision for sustainable use of the aquatic resources in Malawi has to be fixed urgently based on the fact that fish resource in Malawi is exposed to the situation of over-fishing. Else Skjonsberg(1992) concluded that

Imai, I., Inland Water Fishing in Malawi (5)

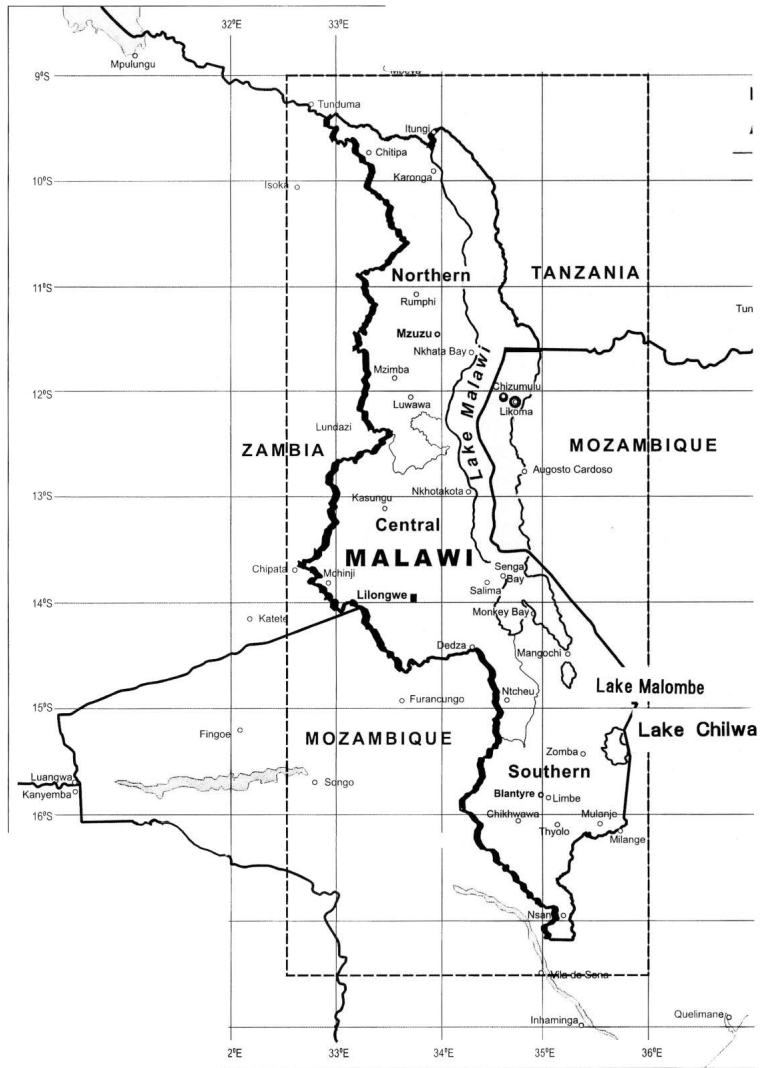


Figure 1: Map of Malawi

virtually every regional development project in the African countries, such as Zambia, failed to realize its original expectations. This is because they have been designed to introduce new techniques which were recommended by the Western world, while taking little notice of the everyday life of the inhabitants of the area. In many cases, activity patterns of fishing are restricted because they are on the basis of the modern scientific techniques. For example, particular fishing methods or gears are prohibited exclusively.

In Zambia, all fishing and fish purchasing activi-

ties are prohibited each year from December 1st to February 28th. In addition, to prevent the catching of small fry, subsidiary registration to the act prohibits nets of mesh size of less than 1.5 inches (3.8 centimeter) (Republic of Zambia, 1974). In Malawi, supplementary rules of the Fishery Act make detailed rules about fishing craft, gears and methods. As a result of my field researches, the following was made clear that a strict crackdown on violation of the law was not well regulated because both material evidence and manpower contribution are not enough. So that it is not clear whether those rules work fully

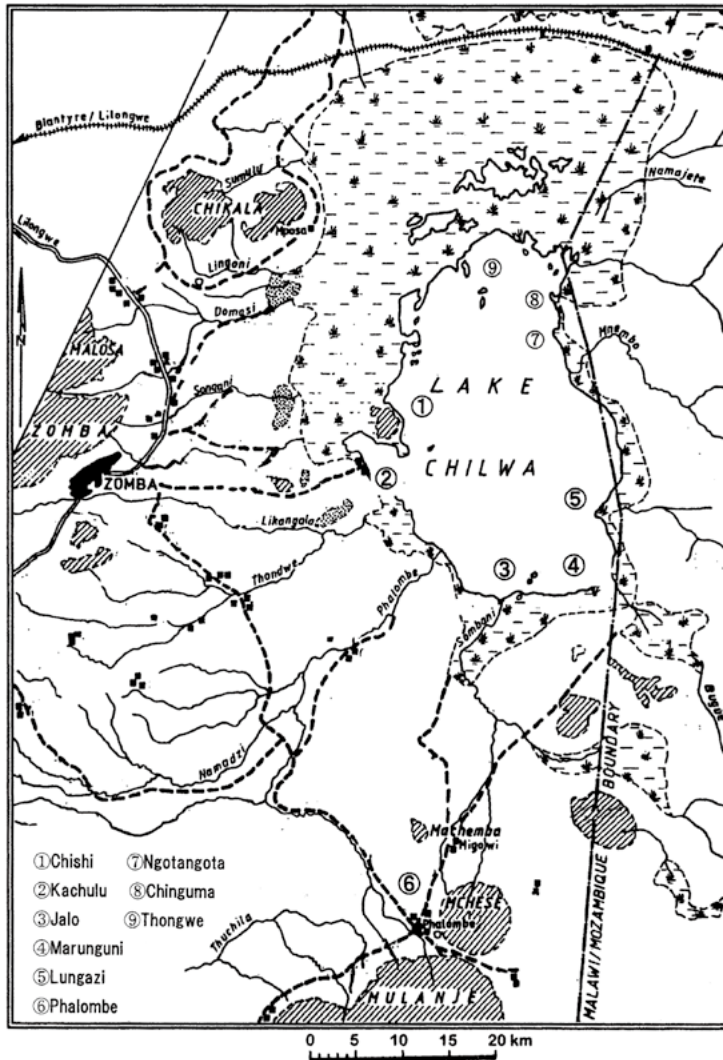


Figure 2: Map of Lake Chilwa

or not. Many of the fishers in Malawi and Zambia complain about prohibition of the fishing methods which they have made use for a long time (Imai,1999).

In recent years, several authors insist that Indigenous Knowledge (IK) of the developing areas in the world have to be reevaluated, which holds in the position of anti-western scientism. The position is also reevaluated that indigenous knowledge of the physical environment, flora and fauna of surrounding areas. Because residents of local society have skillfully understood and produced unique systems through which the resources can be sustainably used (Imai,

1995) instead of denying one-sidedly in the name of “modernization”. The articles that can be given are Johnson ed. (1992), Imai (1998), Mwale & Malekano (2000), Kalanda-Sabola *et al.* (2007) and so forth. Most of them aim to maintain sustainable use of water resources by looking at the indigenous way of use objectively. I am of the opinion that the indigenous knowledge has to be appreciated properly in the countries such as Zambia, Malawi in which the fisheries regulations are forced top-down decision making.

3. Outline of Fishing in the Lake Chilwa

3.1 Overview of the Lake

The Lake Chilwa is at an altitude of about 622 m above sea level, and it is up to 4~5 m in depth. The whole wetland area of the lake is reported as being about 1850 km² in size with one third (680 km²) occupied by open water, one third by marsh and swamps and one third by floodplain grasslands (Lancaster 1979, K van Zegern 1998). Morgan (1971) reported that the lake has been almost dried up several times in the past because of little rainfall. Table 1 shows the years of water recession and lower water level in the past.

The main perennial tributaries to Lake Chilwa within Malawi are Domasi, Songani, Likangala, Thondwe, Mphalombe, Namadzi and Sombani rivers from Shire Highlands and Zomba Plateau which are located in western side of the lake. The volume of water pouring into the lake from these rivers accounts for 70 % of all amount of water pouring into. The Rivers of Mnembo, Buguwe and Namajete are poured into the lake from the Mozambique side (Fig.2).

The lake has no outlet and therefore lacks the natural flushing of salts, and the lake is shallow (less than 6 meters at high water level) which results in efficient recycling of nutrients. According to Kabwazi & Wilson (1998) and Jamu *et al.* (2006), Lake Chilwa is one of the most productive lakes in tropical Africa. Open water of the lake is totally dominated by three species : the cyprinid minnow *Barbus paludinosus* Peters (Locally known as *matemba*), the clariid catfish *Clarias gariepinus* Burchell (*mulamba*) and the endemic cichlid *Oreochromis shiranus chilwae* Trewavas (*makumba*) (Furse *et al.*, 1979). After Malawi became an independent country in 1964, several scientists (mainly biologists) started an extensive survey in the late 1960s in the Lake Chilwa. Next, members of the biology department, Chancellor College, University of Malawi carried out a biological research, and *Lake Chilwa Monograph* (Kalk *et al.* 1979) was submitted as a research report.

Lake Chilwa has been the focus of extensive biological research since the late 1990s. which was done at the request of the Government of Malawi, which needed the data to designate Lake Chilwa as a wetland of importance, and so accede to the Ramsar

Convention, international convention for conservation and sustainable use of wetlands. Members of the Biology Department of Chancellor College, University of Malawi carried out their research work since the first half of 1996. As a result, The Lake Chilwa was designated as a sanctuary of the Ramsar site in 1997.

In recent years, members of the Center for the Social Research, Chancellor College, University of Malawi have embarked upon a study of environmental sociology about sustainable use and management of the water resources (Njaya F. 2007, 2014, Mvula *et al.* 2014).

Table 1: Years of Recession in the Lake Chilwa since 1900.

1900	
1914~1915	catastrophic recession
1922	
1931~1933	
1934	
1954	
1960~1961	
1968	catastrophic recession
1973	catastrophic recession
1995	catastrophic recession
2012~2013	
2018~2019	catastrophic recession

Adapted from Kabwazi and Wilson(1998) and field notes of the author

3.2. Overview of Fishing in the Lake Chilwa

Residents of south-western area of the lake (Phalombe District and Zomba District) have set their fishing camp and depended upon the fishing activity many years' experience (Williams,1969; Agnew & Chipeta, 1979). Kabwazi & Wilson (1998) described that a number of people involved up to more than 6,000, and in the size of catch is more than 20,000 metric tonnes in a good year. The number of people dependent on the Lake Chilwa fishery including broker, retailer and transporter is estimated at about 180,000. Kalk *et al.* (1979) listed 26 species of fish grouped into 10 families (Tab.2). The marsh area contributes about 30 % of the total water area and is important as main fishing ground.

Kabwazi & Wilson (1998:95) shows that the average fish yield of the Lake Chilwa is higher than that of the other lakes in the African continent similar

to that of the Lake Malombe adapted from Fryer and Iles (1973) and Furse *et al.* (Tab.3). It can be said that the fishing of these inland lakes in Malawi plays a key role for eating habits of the residents. Fish production in the lake has been at its highest during years of high water levels, and when water level is low, total fish landing decreases. During the years of 1965 to 1968, 1973, 1995, 2012 to 2013 and 2018 when the lake dried up, there was a dramatic fall in the fish landings. So that fish production responds to receding and rising lake levels. Although stages of recovery differ between the species, fish production takes three or four years to recover (Kabwazi & Wilson, 1998).

In these days, a project of irrigation farming has begun to work. Several villagers have doubts about the project. The doubts are being expressed as to whether the water is used for the project, so that water level of the lake has become lower.

Lake Chilwa experiences considerable seasonal or periodic changes in the lake water level, some of which have had catastrophic consequences, such as

Table 2: Fish Species of the Lake Chilwa.

Family	Species
Mormyridae	<i>Marcenius macrolepidotus</i>
	<i>M. livingstoni</i>
	<i>Petrocephalus catostoma</i>
Characidae	<i>Hemigrammopetersius barnadi</i>
	<i>Alestes imberi</i>
Cyprinidae	<i>Barbus cf. afrohimitoni</i>
	<i>B. kerstenii</i>
	<i>B. paludinosus</i>
	<i>B. trimaculatus</i>
	<i>B. cf. viviparus</i>
	<i>B. sp. B</i>
	<i>B. sp. C</i>
<i>Labeo cylindricus</i>	
Bagridae	<i>Leptoglanis rotundiceps</i>
Clariidae	<i>Clarias gariepinus</i>
	<i>C. theodorae</i>
Schilbeidae	<i>Pareutropius longifilis</i>
Mochokidae	<i>Chiloglanis neumanni</i>
Amphiliidae	<i>Amphilius platychir</i>
Cyprinodontidae	<i>Aplocheilichthys johnsonii</i>
	<i>Nothobranchius kirki</i>
Chichlidae	<i>Haplochromis callipterus</i>
	<i>Haplochromis sp.</i>
	<i>Pseudocrenilabrus philander</i>
	<i>Oreochromis shiranus chilwae</i>
	<i>Tilapia rendalli</i>

Source : Kirk (1967), Kabwazi and Wilson(1998)

Table 3: Fish Yield per unit in Selected Lakes in Africa. (adapted from Kabwazi & Wilson(1998))

Lake	Year or Period	Area (sq.km)	Yield (kg/ha/yr)
Chilwa(Malawi)	1976	1256	159
Malombe(Malawi)	1976	406	131
Kioga(Uganda)	1963~1965	2280	80
Malombe(Malawi)	1961~1963	406	37
Rukwa(Tanzania)	1963	2202	36
Chilwa(Malawi)	1963~1972	1256	33
Mweru(Zambia)	1967	1540	19
Naivasha(Kenya)	1961~1963	140	14
Bangweulu(Zambia)	1952~1964	7777	9
Mweru(Zambia)	1961~1967	1540	9

a dramatic fall in the fishing activities and fish landings (Kabwazi & Wilson, *ibid.*). In such a case, it is reported that many of the people stop fishing and try to switch to the other subsistence structure, such as keeping a grocery shop, an accommodation and so on. (Allison & Mvula, 2002). In my fact-finding survey which was carried out in 2007, several residents of the Swan'goma village gave me an answer that both men and women worked away for cultivation to the Mozambique area.

4. Results

4.1 Overview of Lungazi

As I stated in the introduction of this article, I carried out field research in the Lungazi area, south-eastern coast of the Lake Chilwa from 17th to 19th August 2015. Although the Chisoni and the Ngombe villages in the Lungazi area are located within Mozambique territory, the region is a Malawian possession. The villages in Lungazi come under the prefectural office of Zomba. Chief (TA: traditional authority) of Chisoni said that the residents of southern shore of the Lake went up north of the eastern lake shore from the Phalombe area in the days of 1920 to expand their farm land. So that they found out the Lungazi area and built up the settlements. In Lungazi area, there are Chisoni, Kumbini, Maboloma and N'gombe villages, total number of the residents are about 450. After the villages were established, most part of the lake shore farm land were given up soon because crops were damaged by the resident's sheep and goats. Because number of their small stock increased rapidly. He also said that

most of the farm land are located in the Mozambique territory. The people cultivated mainly maize and rice before. However, in these days, many of them are engaged in the cultivation of cassava and rice.

Greater part of the residents in Lungazi area are engaged in fishing, fish trading and fish carrier since a lot of fish is living in the water area around. Based on the interviews with the fishers and traders in Lungazi, many fishers come from the Phalombe District besides the Lungazi area (Chisoni and N'gombe), and many of the fish traders come from the Phalombe and Mulanje Districts (Tab.4~9). It is also said that little number of people comes from the Mozambique area where is located in a close range. I carried out the interviews with the fishers and traders in two fish landing shores of Chisoni and N'gombe. The same questionnaire was used in the interviews which was used in the Phalombe District shores (Jalo and Marunguni) in 2007 (Appendix, Imai 2009). The interview was done with assistance of Mr.A.Nkhoma and Mr.D.Manda, Department of Fisheries, in 2015.

4.2 Results of Research (Chisoni and N'gombe in Lungazi)

Fishers : Chisoni

Ethnicity of all the fishers is the Lomwe except for one Chewa. Half of them have come from the Phalombe and the other from Chisoni village, the Zomba District. All fishing units adopt Nkacha net fishing method. Nkacha is one of the open water seines (Dept of Fisheries, 2012:38). This method is used mainly in the period of March to November (Tab.4,5).

Fishers : N'gombe

According to the interview from 12 fishers, 9 of them are the Lomwe, 2 are the Nyanja and 1 is the Chewa (Tab.6,7). So that majority of the fishers' ethnicity is the Lomwe similar to the fishers who are involved in fishing in the other areas of the Lake Chilwa. 7 fishers have come from the Zomba District (Chisoni and N'gombe), 4 from the Phalombe and 1 has from the Mangochi, which is located at the eastern-south of the Lake Malawi. 7 fishing units adopt Nkacha net method, 2 units adopt fish traps method (*mono*), 2 adopt longline and 1 adopt stationary gillnet method.

Traders : Chisoni, N'gombe

According to Tab.8 and 9, ethnicity of the

Table 4: Fishers of the Lungazi village (N'gombe) Aug. 2015 (by Manda)

Ethnicity	District (Village)	Fishing Method	Fishing Period	Fish Species
1. Lomwe	Zomba (Chisoni)	Nkacha (Open water seines)	?	Muramba, Makumba, Matemba
2. Lomwe	(Phalombe)	Nkacha (Open water seines)	March.to November	As above
3. Lomwe	Zomba (Ngombe)	Nkacha (Open water seines)	March to October	As above
4. Lomwe	Phalombe	Nkacha (Open water seines)	March to November	As above
5. Lomwe	Zomba (Chisoni)	Nkacha (Open water seines)	March, April	As above
6. Lomwe	Phalombe	Nkacha (Open water seines)	March to July	As above
7. Lomwe	Zomba	Nkacha (Open water seines)	March to November	As above

Interviewed in August 2015

Table 5: Fishers of the Lungazi Village (Chisoni) Aug. 2015 (by Nkhoma)

Ethnicity	District (Village)	Fishing Method	Main Fishing Period	Fish Species
1. Lomwe	Zomba	Nkacha	March to April	Muramba, Makumba, Matemba
2. Lomwe	Zomba	Nkacha	February to March	As above
3. Lomwe	Phalombe	Nkacha	March to April	As above
4. Chewa	Phalombe	Nkacha	February to April	As above
5. Lomwe	Zomba	Nkacha	February to March	As above
6. Lomwe	Zomba	Nkacha	February to March	As above

Interviewed in August 2015

Table 6: Fishers of the Lungazi (N'gombe) Aug. 2015 (by Nkhoma)

Ethnicity	District	Fishing Method	Fishing Period	Fishing Time
1. Lomwe	Phalombe	Nkacha	4~12	daytime
2. Lomwe	Phalombe	Nkacha	4~11	daytime
3. Lomwe	Zomba	Nkacha	4~11	nighttime
4. Lomwe	Zomba	Long lines	2~4	nighttime
5. Lomwe	Zomba	Nkacha	10~	nighttime
6. Lomwe	Phalombe	Nkacha	10~	daytime
7. Lomwe	Zomba	Nkacha	10~	daytime
8. Lomwe	Zomba	Long lines	1~3	daytime
9. Chewa	Mangochi	Nkacha	12~4	nighttime

Interviewed in August 2015

Table 7: Fishers of the Lungazi (N'gombe) Aug. 2015 (by Manda)

Ethnicity	District	Fishing Method	Fishing Period	Fishing Time
1. Lomwe	Phalombe	basket	2~8	nighttime
2. Nyanja	Zomba	basket	2~7	nighttime
3. Nyanja	Zomba	gillnet	1~3	nighttime

Interviewed in August 2015

Table 8: Fish Traders of the Lungazi Village (Chisoni and N'gombe) (by Nkhoma and Manda)

Gender	Ethnicity	Transport	Fish Market	Type of Business
1. Male	Lomwe	bicycle, Bus	Limbe	Wholesale
2. Male	Lomwe	?		Wholesale
3. Male	Lomwe	bicycle	Mulanje	Wholesale
4. Male	Lomwe	bicycle	Mulanje	Wholesale
5. Male	Lomwe	bicycle	Mulanje	Wholesale
6. Male	Lomwe	bicycle	Mulanje	Wholesale
7. Male	Lomwe	bicycle, Bus	Mulanje	Wholesale
8. Male	Lomwe	bicycle	Mulanje	Wholesale
9. Male	Lomwe	bicycle	Mulanje	Wholesale
10. Male	Lomwe	bicycle	Mozambique	Wholesale
11. Female	Lomwe	bicycle	Mozambique	Wholesale
12. Female	Lomwe	walk	Mozambique	Wholesale
13. Male	Lomwe	bicycle	Thyolo	Wholesale
14. Male	Lomwe	bicycle	Phalombe	Wholesale

Interviewed in August 2015

Table 9: Fish Traders of the Lungazi Village (N'gombe) (by Manda)

Gender	Ethnicity	Transport	Fish Market	Type of Business
1. Male	Chewa	bicycle	Phalombe	Wholesale
2. Male	Lomwe	bicycle	Phalombe	Wholesale
3. Male	Lomwe	bicycle	Mulanje	Wholesale
4. Male	Lomwe	bicycle	Tyolo	Wholesale

Interviewed in August 2015

Table 10: Fishers of the Chinguma Village Aug.2019 (interviewed by D.Mphalalo)

Ethnicity	District (Village)	Fishing Method	Main Fishing Period
1. Lomwe	Phalombe	seine net	3~11
2. Lomwe	Zomba	gill net	1~12
3. ?	Phalombe	?	4~11
4. ?	Zomba*	gill net	1~12
5. Lomwe	Zomba*	gill net	4~11
6. Chewa	Zomba*	gill net	1~12
7. Nyanja	Zomba*	seine net	4~11
8. Chewa	Zomba*	gill net	1~12
9. Yao	Zomba*	seine net	4~11
10. Maganja	Zomba*	seine net	3~11
11. Lomwe	Phalombe	gill net	1~12
12. Lomwe	Phalombe	gill net	1~12
13. Lomwe	Phalombe	handline	1~12
14. Nyanja	Zomba	seine net	3~11
15. Lomwe	Zomba	gill net	1~12
16. Yao	Zomba*	gill net	1~12
17. Maganja	Zomba	gill net	7,8
18. Lomwe	Mozambique	seine net	3~11
19. Nyanja	Zomba*	seine net	3~11
20. Lomwe	Zomba	seine net	3~11

*: Namalele village in Chinguma Area

Table 11: Fish Traders of the Chinguma Village (interviewed by J.Manjawira) Aug.2019

Gender	Ethnicity	District	Transport	Fish Market	Type of Business
1. Male	Maganja	Machinga	bicycle	Cede+	retail
2. Male	Lomwe	Zomba*	boat, vehicle	Limbe	wholesale
3. Female	Lomwe	Zomba	walk	Naminga+	wholesale
4. Female	Lomwe	Zomba	walk	Naminga+	wholesale
5. Male	Lomwe	Mozambique	bicycle	Mekanera+	retail
6. Male	Lomwe	Mozambique	bicycle	Mekanera+	retail
7. Male	Lomwe	Mozambique	bicycle	Mekanera+	retail
8. Female	Lomwe	Phalombe	walk	Naminga+	wholesale
9. Female	Lomwe	Zomba	walk	Naminga+	wholesale
10. Male	Sena	Zomba*	bicycle	Mkukuwa+	wholesale

*: village in Chinguma area. , +: market in Mozambique

18 fish traders is the Lomwe except 1 Chewa. Although most of them have come from the Mulanje, Lungazi (Chisoni, N'gombe) and Phalombe, the trader who comes from the Thyolo and Mozambique area one by one (Tab.9). It can be said that most of the fish catch are sold off in the Malawi markets, such as Mulanje and Phalombe, rather than those in the Mozambique area which are located in a short distance. Many of the fish traders put the fish basket on their own bicycle and carry it to the market in Malawi. They always use a route of passing through the eastern shore of the lake from Lungazi to the Malawi markets.

**Figure 3: Bicycles in the Beach of Chinguma**

4.3 Overview of Chinguma

I carried out another field research in the Chinguma and Ngotangota areas, north-eastern coast of the Lake Chilwa from 16th to 18th August 2019. Although the Chinguma and Ngotangota villages are located within Mozambique territory, the regions are Malawian possession. These areas come under the prefectural office of Zomba as same as the case of Lungazi area. As in Lungazi area, greater part of residents are engaged in the activities of fishing, fish trading and fish carrier. I carried out the interviews with the fishers and traders in two fish landing shores of Chinguma and Ngotangota. The interview was done with assistance of Mr.D.Mphalalo and Mr.J.Manjawira, Department of Fisheries in Zomba. In this article, results of research record in Chinguma beach are presented. The record of Ngotangota is to be reported in the following research report.

4.4 Result of Research (Chinguma)

Fishers: Chinguma

Characteristics of the fishers is indicated in Table 10. According to the interview from 20 fishers, 9 of them are the Lomwe, 3 are the Nyanja and 2 are the Chewa, the Yao, the Maganja respectively. 14 fishers have come from the villages of Zomba (9 of them from the Chinguma village) and 5 from the villages of Phalombe District. Only one fisher has come from the Mozambique area. Half of the fishers adopt the open seines (*nkacha*), and the other adopt the gill net fishing method. According to the interviews from the other beach in Chinguma, a lot of fishing units adopts the fish trap (*mono*), long line and handline (*chomanga*) method.

Traders: Chinguma

According to Tab.11, ethnicity of the 8 fish traders is the Lomwe except for one Maganja and one Sena. 5 of them have come from the Zomba, 3 from the Mozambique and the other 2 from the Phalombe and Machinga District. Many of the fish traders put the fish on their bicycle and carry it to the Mozambique markets. (Fig.3)

2004 and 2007. In my report (*ibid.*), I indicate that the fishers have a strong trend to adopt the *nkacha* net fishing. According to the Frame Survey (2012) of the fisheries, *nkacha* seines are illegal method in Lake Malawi to avoid over-fishing. In recent years, a conflict between the stationary gillnet fishers and the *nkacha* net fishers has come into the open. Based on the interview from the fishers and fish traders at the fish landing sites of Lungazi (Chisoni and N'gombe), their ethnicity is the Lomwe. They carry fish and sell it at the markets in Malawi. Many fishers come from the villages in the Lungazi area or the southern shore of the Lake Chilwa, such as the Mulanje and Phalombe area. I did not find a fisher who came from the Mozambique area. The Malawi currency (Malawi Quacha) passes freely almost everywhere in the case of goods other than fish. It can be said that little amount of fish catch is dealt with the markets in Mozambique. From the above, the Malawian traders tend to make inroads into the markets in the both countries rather than the Mozambicans.

As shown in Tab.10 and 11, several points of difference between the two fish landing shores (Lungazi and Chinguma) are clear. Although the greater part of the fishers come from the villages in Malawi, half the number of the fish traders come from the area in Mozambique. In contrast to the case of Lungazi, the greater part of the fish traders in Chinguma carry fish and sell it at the markets in Mozambique. It can be said that people are able to carry fish easily to the Mozambique area by road from the fish landing beaches.

In the future research, I intend to carry over an inquiry and accumulate information about system of cultivation and fishing around Lungazi and Chinguma especially Thongwe Island on the lake, based on interviews from the residents. People's way of living in the north, east and western side of the Lake Chilwa has to be clarified also, and comparative analysis of them become more important for promotion of the inland fishing in Africa. Since the real situation of resource use system and its principle around the Lake Chilwa will be made clear.

5. Discussion

I reported a tendency of fishing activity in the fish landing places of the southern shore of the Lake Chilwa (Imai,2015) based on my research in

ACKNOWLEDGEMENT

This study was made possible by the financial sponsorship of the Japanese Ministry of Education, Sports, Science and Culture, under which I

Imai, I., Inland Water Fishing in Malawi (5)

was a Research Affiliate of the Biology Department, Chancellor College, University of Malawi. I would like to express my heartfelt appreciation to all who supported me provided advices in carrying out this study since 1999: Prof. Ambali, A., Professor of Chancellor College, Dr. Rusuwa, B., Associate Professor of Biology Department, the late Dr. Malekano, lecturer, Chancellor College, and all the other members of the Biology Department of Chancellor College; Mr. Chikoko, Mr. Manda, Mr. Mphalalo, Mr. Manjawira, Zomba Fishery; Mr. Nkhoma, Salima Fishery; for their kind support and hospitality. Thanks are also due to all the kind people in the research area, and all of my friends, the fishers and fish traders in the Lake Chilwa, who showed me much kindness and gave me much help during the periods of my research. This research was also made possible by the Personal Special Research Fund from Kwansiegakuin University in 2019.

REFERENCES

- Agnew, S. and C. Chipeta (1979) "Fishing and Fish Trading : Economic Studies" in M. Kalk, A. J. McLachlan, and C. Howard-Williams (eds.) *Lake Chilwa : Studies of Change in a Tropical Ecosystem*, Monographiae Biologicae Vol. 35, Dr. W. Junkl b.v. Publshers, The Hague-Boston-London, pp. 343-368.
- Allison, E. H. and M. P. Mvula (2002) "Fishing Livelihoods and Fisheries Management in Malawi" *LADDER Working Paper* 22:1-30.
- Ambali, A. J. D. and H. H. Kabwazi (1999) "The Study of Fish Reproductive Biology in Lake Chilwa and Mpoti Lagoon with Special Reference to Fishery Conservation Measures and in Relation to Changes in Lake Regime" *State of the Environment Study* 6:1-52.
- Yuji Ankei (1982) "Folk-Knowledge of the Fish among the Songola and the Bwari – Comparative Ethno-ichthyology of the Zaire River and Lake Tanganyika Fishermen." *Journal of African Studies* No. 21:1-56. (in Japanese)
- Brelsford, W. V. (1946) *Fishermen of the Bangweulu Swamps : A Study of the Fishing Activities of the Unga Tribe*. Manchester University Press.
- Fisheries Department (1994) *Annual Frame Survey Fisheries Department*, Ministry of Agriculture, Malawi.
- Fryer, G. and T. D. Iles (1972) *The Cichlid Fishes of the Great Lakes : Their Biology and Evolution*, Oliver and Boyd, London.
- Furse, M. T. R. G., Kirk, P. R., Morgan and D. Yeedle (1979) "Fishes: Distribution and Biology in Relation to Changes" in M. Kalk, A. J. McLachlan and C. Howard-Williams (eds.), *Lake Chilwa : Studies of Change in a Tropical Ecosystem*, Monographiae Biologicae vol. 35, Dr. W. Junk b.v. Publishers, The Hague-Boston-London, pp. 175-208.
- Ichikawa, M. (1985) "A Comparison of Fishing Strategies in the Bangweulu Swamps", *African Study Monographs, Supplementary Issue* 4:25-48.
- Imai, I. (1985) "Fishing Life in the Bangweulu Swamps : A Socio-ecological Study of the Swamp Fishermen in Zambia", *African Study Monographs, Supplementary Issue* 4:49-88.
- (1986) "The Activity Patterns of the Fishermen in the Bangweulu Swamps, Zambia", *Journal of African Studies* 29: 1-28. (in Japanese)
- (1987) "Fishing Life in the Bangweulu Swamps (2): An Analysis of Catch and Seasonal Emigration of the Fishermen in Zambia", *African Study Monographs, Supplementary Issue* 6:33-63.
- (1991) "Fishermen of the Swamps — Activity of the stationary gillnet fishers in the Bangweulu Swamps, Zambia — . in Tanaka, J. and Kakeya, M. (eds.) *Monographs of the Human Being*: 487-505. Heibonsha, Tokyo. (in Japanese)
- (1995) "Stationary Gillnet Fishing in the Bangweulu Swamps: Fishing and Trading Strategies", *Humanities and Economics* 30:1-30. Faculty of Humanities, Hirosaki University.
- (1998) "Sustainability of Fishing in the Bangweulu Swamps, Zambia", *African Study Monographs* 19(2):69-86.
- (1999) "Sustainability of Fish Resources in the Bangweulu Swamps, Zambia", *Studies in the Humanities, Social Sciences* No. 3:1-16. Faculty of Humanities, Hirosaki University. (in Japanese).
- (2000) *Papirusu no Fu* Kindaibungeisha, Tokyo. (in Japanese)
- (2005) "Problems and Prospects of Inland Water Fishing in Malawi : A Case of the Lower-Shire River" *The Journal of Policy Studies* No. 21 : 15-26., School of Policy Studies, Kwansiegakuin University. (in Japanese)
- (2008) "Driving Fish Method in the Tropical Inland Water Area — A Case of the Bangweulu Swamps, Zambia —". *The Journal of Policy Studies* No. 28:135-148. School of Policy Studies, Kwansiegakuin University. (in Japanese)
- (2009) "Problems and Prospects of Inland Water Fishing in Malawi(2) : A Case of Southern Area of the Lake Chilwa" *The Journal of Policy Studies* No. 31 : 131-140., School of Policy Studies, Kwansiegakuin University. (in Japanese)
- (2013) "Problems and Prospects of Inland Water Fishing in Malawi(3) : A Case of the Elephant Marsh and the Bangula Lagoon area of the Lower-Shire Valley" *The Journal of Policy Studies* No. 42 : 1-12. School of Policy Studies, Kwansiegakuin University. (in Japanese)
- (2015) "A Consideration on the Change of Fishery Resources Use in Wetland Area, Malawi — A Case of Southern Area of the Lake Chilwa —", *Journal of African Studies* No. 87 : 65-76. (in Japanese)
- (2017) "Problems and Prospects of Inland Water Fishing in Malawi(4): A Case of Lungazi-South-Eastern Area of the Lake Chilwa~" *The Journal of Policy Studies* No. 54:1-13. School of Policy Studies, Kwansiegakuin University. (in

- Japanese)
- (2019) “Fishers of the Wetlands in Africa—A Case of the Lake Chilwa, Malawi—” in Imai(ed.) *Cultures of the African Fishers—From the Point of Conservation in the Water Shore Environment* : 199-225. (in Japanese)
- Jamu, M.D., M.D.Leanda, and E.C.Christine(2006)
 “Transboundary Management Plan for the Lake Chilwa Catchment Area”, *Highlighting the Impacts of North-South Research Collaboration among Canadian and Southern Higher Education Partners*, Association of Universities and Colleges of Canada. Pp.33-44.
- Johnson, M.(ed.)(1992) *Lore : Capturing Traditional Environmental Knowledge*. International Development Research Centre, Ottawa.
- Yukiko Kada (ed.) (1998) *A Study of Sustainable Resource Use in the Lake Malawi — in Comparison with the Case of the Lake Biwa —*. Final Report of the 1996~1998 fiscal year, Toyota Foundation. (in Japanese)
- Yukiko Kada, Setsuko Nakayama and L.Malekano (2002)
 “Does *Mbuna* taste bad? — Food Culture in Malawi and Environmental Issues. In M.Miyamoto and M.Matsuda (eds.) *Social Change in the Modern Africa*. Jinbun Shoin. Pp260-283. (in Japanese)
- Kabwazi, H.H. and J.G.Wilson (1998) “The Fishery of Lake Chilwa”. In K.van Zergern and M.P.Munyenyembe, *The Lake Chilwa Environment, A Report of the 1996 Ramsar Site Study*. Department of Biology, Chancellor College, University of Malawi. pp.91-108.
- Kalanda-Sabola, M.D.E.M.T.Henry, E.Kanyambazinthu and J.Wilson (2007) “Use of Indigenous Knowledge and Traditional Practices in Fisheries Management: A Case of Chisi Island, Lake Chilwa, Zomba.” *Malawi Journal of Science & Technology* 8:009-029.
- Kalk, M.A.J. Mclachlan and C.Howard-Williams (eds.)(1979)
Lake Chilwa : Studies of Change in a Tropical Ecosystem. Monographiae Biologicae Vol.35., Dr.W.Junk b.v.Publishers, The Hague-Boston-London.
- Kirk, R.G. (1967) “The Fishes of Lake Chilwa”. *Soc.Mal.J.* 20(1):35-48.
- Kurita, K. (2000) “Lomwe” Ayabe, T.(ed.) *Encyclopedia of the World Ethnic groups* pp.767., Kobundo. (in Japanese)
- Lancaster, N.(1979) “The environment setting : the changes in the lake level.”, in M.Kalk, A.J.Mclachlan and C.Howard-Williams(eds.) *Lake Chilwa : Studies in a Tropical Ecosystem*, Monographiae Biologicae Vol.35:41-58, Dr.W.Junk b.v.Publishers. The Hague-Boston-London.
- Malawi Government (1997) “*Fisheries Conservation and Management Act 1997* (No.25 of 1997), The Government Printer, Zomba, Malawi.
- Morgan, P.R.(1971) “*The Lake Chilwa Tilapia and its Fishery*”, *African Journal of Tropical Hydrobiology of Fish* “1(1):51-58.
- Mususa, N.C.J. (2004) *Nasnje District State of Environmental Report on Fisheries Resources, Produced at Bangula Fisheries Station*. Department of Fisheries, Malawi.
- Mvula, P., M.Kalindekafe, P.Kishindo, E.Berge and F.Njaya (eds.) (2014) *Towards Defragmenting the Management System of Lake Chilwa Basin, Malawi*. LIT Verlag Munster.
- Mwale, G. and L.Malekano (2000) *Indigenous Knowledge Systems in the Management of Natural Resources: Problems and Prospects: Some Lessons from Chembe Fishing Village*, Chancellor College, Zomba.
- Njaya, F. (2014) “Governance Challenges for the Implementation of Fisheries Co-Management : Experiences from Malawi”, *International Journal of the Commons* 1(1):123-139.
- (2014) “Challenges in the management of the Lake Chilwa”, in P.Mvula, M.Kalindekafe, P.Kishindo, E.Berge and F.Njaya(eds.), *Towards Defragmenting the Management System of Lake Chilwa Basin, Malawi*, LIT Verlag Munster, pp.37-46.
- Republic of Zambia (1974) *The Fisheries Act*. Ch.314 of the Laws of Zambia, Government Printer, Lusaka, Zambia.
- Skjonsberg, E. (1992) “Man, Money and Fisheries Planning : The Case of the Northern Province of Zambia”, in I.Tvedten and B.Hersong (eds.), *Fishing for Development : Small-scale Fisheries in Africa*, Nordika Afrikaistitutet. Uppsala, pp.155-172.
- Van Zegeren, K. and M.P.Munyenyembe (eds.) (1998) *The Lake Chilwa Environment, A Report of the 1996 Ramsar Site Study*, Department of Biology, Chancellor College, University of Malawi.

Appendix

The Questionnaire used in the interview

Interviewee's Name, Date, Village, District, Name of Market/fish landing place

★ to fisher

1. (i) Name of informant, ethnic group, sex
(ii) Name of village, District
2. (i) Fishing method (local name)
(ii) Number of the unit member
3. Fishing season (month)
4. (i) Fishing ground (area)
(ii) Fishing gears
5. Do you preserve the fish after catch?
6. Where do you sell fish?
7. Fish price (How much per unit?)

★ to fish trader

1. (i) Name of informant
(ii) Name of village, District
2. How do you buy fish? (by cash or barter)
3. Where do you go for selling fish?
4. How do you carry fish for selling? (by bicycle, on foot or by vehicle)
5. How long do you stay in this point to buy fish?