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**Title of paper:** Fisheries co-management as a strategy for contribution to enhanced livelihoods and food security.

### **Abstract**

Fisheries co-management as understood in Malawi refers to the participation of fishing communities and the Department of Fisheries in the management of fishery resources. Community participation in natural resource management can take different forms ranging from where the government (or managing authority) takes much of the control, in what is commonly termed top-down or instructive to where the communities take full control of resource management. Experiences in Malawi have shown that, while the development and formulation of co-management policy and strategies directly centred on fisheries conservation, the impact of such strategies has been enhanced livelihood and improved food security in some water bodies where co-management has been introduced. This paper presents results of field research work in Lake Chiuta where co-management policy and strategies developed by the Department of Fisheries with consultation of the user community has yielded extra results. Lake Chiuta, has been under the control of local people with *de-facto* territorial user rights until of late, when co-management was introduced in the mid 1990s. Following this introduction, the Chiuta fishing communities have claimed improved livelihood and enhanced food security as being due to the introduction of co-management in the area. These results are based on the premise that the Chiuta community have a comprehensive understanding of their fishery resource, such that outsiders are not allowed to introduce fishing gears that will disturb the ecological balance of the fishery resource. In this case beach seine nets are not allowed in the lake. Co-management was therefore introduced in the lake to provide legal basis for the exclusion of beach seine net fishers. The policy implication from this study is that co-management should not only be viewed as a conservation measure but also as a development strategy.

Key words: Co-management, State intervention, traditional resources, territorial rights, livelihood, and food security

## Introduction

Fisheries co-management as understood by the Department of Fisheries (DoF) in Malawi refers to the participation of fishing communities and the Department of Fisheries in the management of fishery resources. Community participation in natural resource management can take different forms ranging from where the government (or managing authority) takes much of the control, in what is commonly termed top-down or instructive to where the communities take full control of resource management.

The introduction of co-management in Malawi was based on policy and strategies that aim at sustainable resource management and is biologically oriented. However, despite the fact that the co-management approach introduced in Malawi is harboured in the conservation paradigm, the results being experienced within the fishing communities goes beyond resource management to improved livelihoods and enhanced food security. This paper presents results of field research work done in Lake Chiuta where co-management is being practised.

### Introduction of study area – Lake Chiuta

Lake Chiuta is a shallow lake with a mean depth of 5m and located at an altitude of 620m in the southern part of Malawi. It is shared between Malawi and Mozambique, and has a total surface area of about 200km<sup>2</sup>, of which 40km<sup>2</sup> lie in Mozambique (FAO, 1994). It is the fourth largest lake in Malawi after lakes Malawi, Chilwa and Malombe (see figure 1). The lake is fed by a number of affluent streams and is sometimes connected by a swampy channel to Lake Amaramba in Mozambique. The major affluent rivers include Lifune, Chitundu and Mpili rivers. It is drained by Lujenda river, a major tributary of Ruvuma River which drains to the Indian Ocean. To the south, Lake Chiuta's associated marshes are separated from those of Lake Chilwa by a sand bar of about 20m higher than the present lake levels. The lake has a number of islands such as Big Chiuta, Small Chiuta, Nthambalale, Njiriti, Nanyowe, Likanye, and Phiri la mtsatsi.

The Chiuta fishery is a multi-species fishery and is characterised by small-scale artisanal fishers who fish both for subsistence and commercial purposes. The technology of exploiting the resources is still traditional, with the use of gillnets, fish traps and longlines in dug out canoes. According to the 2003 frame survey results, there were only a few planked boats (5), all without motors, and 424 dugout canoes; 10,702 gillnets, 3,443 fish traps, 540 *nchomanga* (this is where a number of hooks, about three to five are attached to one string and set using weights and floats individually) and 151 longlines, operated by 875 gear owners and 170 assistants (DoF 2004). The absence of motorised boats is due to the nature of the fishery and the distances the fishers have to cover to the fishing grounds. There are four main fish species which dominate the catches and these are; *Oreochromis shiranus* (*Makumba*); *Tilapia rendalli* (*Chilunguni*); *Burbus paludinosus* (*Matemba*); and *Clarias gariepinus* (*Mlamba*). The lake habitat is relatively less degraded with muddy bottom and a lot of submerged vegetation. The southern part is more or less permanently covered with emergent vegetation penetrable by canoes but not larger craft.



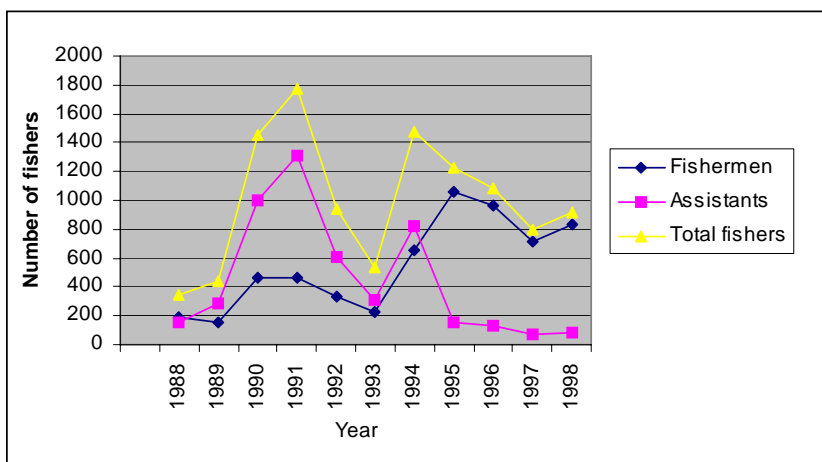
Figure 1: Major fishing and water bodies in Malawi

Fishers believe the fish stocks are more sedentary although there is a widespread belief among others that the fish migrates within the lake. The general belief is that during the months of June to September (cold season), some species are less common in the northern part of the lake and quite abundant in the southern end (Nafisi), where there is a lot of submerged vegetation. Other fishers believe these species migrate to the south during cold season and come back when the waters are warm again. Others believe the differences in the catches are due to God's will, and that there is no migration. Unfortunately, there is no biological evidence to support these ideas (Donda 2001).

Gillnet fishery, by far dominates the fishing activities in the lake, followed by fish traps and *nchomanga* (this is where a number of hooks, about three to five are attached to one string and set using weights and floats individually). Gear owners who also do the fishing

alone dominate the fishery. There are very few ancillary workers at present as opposed to the early 1990s when seine netting was common in the lake

In 1972 only 200 fishermen were reported to be actively fishing in the lake. By 1990 the total number of fishers had increased to about 468 with 975 assistants, making a total of 1443 fishers, by then the fishers had a total of 350 fishing craft, of which 282 were dugout canoes, 68 were boats without engines (FAO, 1994). The large increase in the number of fisher, especially the assistants, was due to the introduction of seine nets in the lake. The 1996 frame survey results revealed that the total number of fishers had decreased to 1088, although the total number of gear owners had increased to 962. The overall decrease in the number of fishers had been due to the drastic decrease in the number of assistants that came to only 126, due to the departure of nkacha fishers from the area. The 1998 figures were not far from those of 1996. The number of gear owners came to 831 and the assistant fishers to 86, giving a total number of fishers for 1998 as 917 fishers (see figure 2). The increase in the gear owning fishers reflects the change in fishing practices that took place when nkacha fishing was banned in the lake.

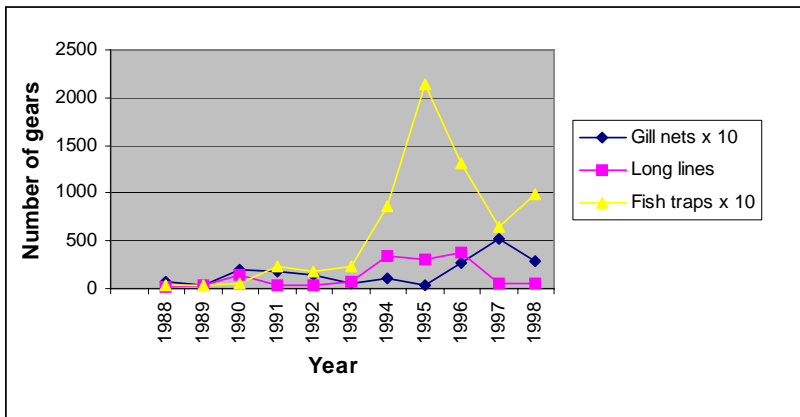


**Figure 2: Changes in the number of fishers between 1988 and 1998 in Lake Chiuta**

In line with the increase in the number of fishers was the increase in the numbers of fishing gears and crafts in the lake. The fishing craft increased from 351 in 1990 to 737 in 1996, with dugout canoes dominating. The main fishing gears in the lake, fishtraps and gillnets increased from 535 and 1,916 in 1990 to 9,940 and 2,902 in 1998 respectively. Of some interest to these figures, was the drastic change in fishing technology.

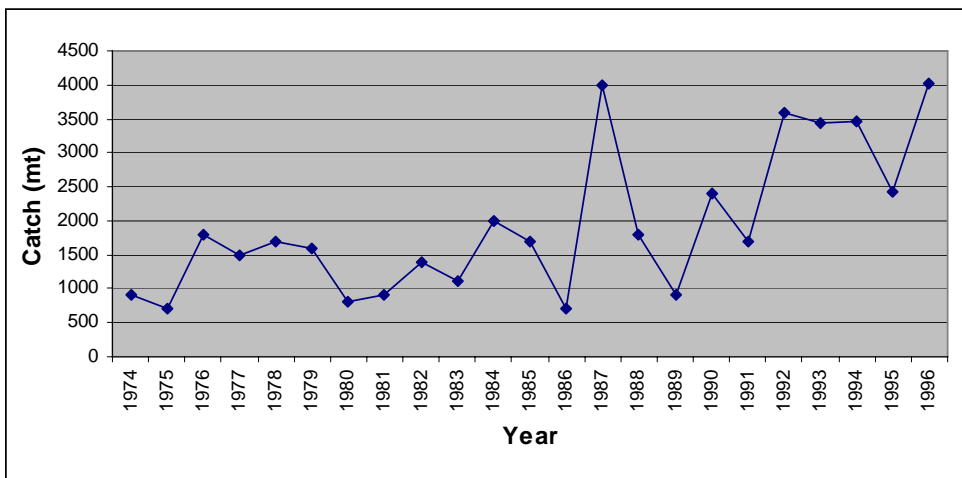
In 1990, gillnets (GN) were the dominating gears, making a contribution of 72% to the total fishing gear population in the lake, followed by fish traps (FT), which contributed about 20%. In 1996, the dominating gears were fish traps, contributing 81%, and gillnets only contributing 17%. During this period, the fishery had shifted from a gillnet fishery to a fish

trap fishery (see figure 3). It is also interesting to note that during the same period, *matemba* seine nets (MS) phased out from the lake. In 1990, *matemba* seine nets contributed about 3% to the total fishing gear population in the lake, in 1994, only 1%, and by 1996, there were no seine nets left.



**Figure 3: Changes in number of dominant fishing gears between 1988 and 1998 in Lake Chiuta**

The total catches for the lake have fluctuated between 700mt. (1970) and 3589mt. (1992). In the 1970's, the average annual fish production was estimated to be around 1400 tonnes. Between 1980 and 1993, annual catches have fluctuated between 700 tonnes (1986) and 4,000 tonnes (1987), giving an average annual fish production for the 1980's of 1600 tonnes. By mid 1990's, the average annual catch was 2700 tonnes.



**Figure 4: Total landings for Lake Chiuta for the period 1974 – 1996**

As observed earlier in figure 3, although there was a shift from net fishery to trap fishery between 1990 and 1996, the overall total catches from the lake kept on increasing (see figure 4). This increase in annual fish catches and the increase in the numbers of fishers as well as the fishing gears indicated an expanding fishery, and therefore it called for a more strategic management system so as to avoid incidences of over-exploitation of stocks.

### **Development of co-management in Malawi – and Lake Chiuta**

Experiences in Malawi have shown that, while the development and formulation of co-management policy and strategies directly centred on fisheries conservation, the impact of such strategies has been enhanced livelihood and improved food security in some water bodies where co-management has been introduced.

In the mid 1980s, Lake Chiuta started to be invaded by seine netters who came to fish for *Matemba* (*Barbus paludinosus*). According to village headman Kunawanga, these seine netters were coming from Thuto<sup>1</sup> area. Initially, the nets that came in were beach seines named after the fish they target<sup>2</sup>. By early 1990s another type of seine net was introduced in the lake from Lake Malombe, and this was the nkacha<sup>3</sup> net. Both seine nets have bunt meshes of about ¼ inches (about 9mm) and less. These fishing gears are non-selective and are known to catch all sizes of different fish species.

Other sources indicate that, initially, these fishers came in from Lake Malombe, but due to the good catches realised from the seines, more and more people joined the fishery from the neighbouring Lake Chilwa. According to DoF records, by early 1995, there were about 300 nkacha fishers operating in the lake. The situation got out of control and the nkacha fishers had no respect for the other lake users. There was scramble for fish. This resulted in constant conflicts between nkacha fishers and other fishers on the lake in that nkacha nets constantly damaged other gears<sup>4</sup>. It was also alleged by those consulted that fish catches began to decline<sup>5</sup>.

In addition to these fisher to fisher conflicts, there were several socio-economic conflicts that the rest of the village communities around the lake experienced. It is also alleged that by that time, Malawi was experiencing poor rainfall, and as a result, all villages around the lake relied on the lake for domestic water supply. As a result of constant nkacha operations in the lake, the water was repeatedly being mixed and it all became turbid making it not suitable for domestic use. The other villagers who had nothing to do with fishing also got affected because the quality of water for domestic use was greatly affected. There were problems to get good drinking water, as a result most households around the lake were not happy with the nkacha fishers.

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<sup>1</sup> Thuto is a place at the southern tip of Lake Chiuta where there is a sand dune that separates Lake Chiuta from Lake Chilwa. These fishers could have been coming from Lake Chilwa.

<sup>2</sup> These seine nets are locally called *Matemba* beach seine nets and operate in Lake Chilwa.

<sup>3</sup> Nkacha net is an off-shore open water seine net which targets small fish species, and may have minimum mesh size that could be less the one quarter of an inch.

<sup>4</sup> The other gears belonged to the local fishers, and these were gillnets, fishtraps and longlines.

<sup>5</sup> The fact that fishing gears belonging to the locals were constantly being disturbed meant that their fishing efficiency was reduced and low catches were experienced. However, the total catches for the lake did not decline as depicted in figure 7.3.

Other problems associated with nkacha fishery as claimed by the consulted fishers and other members of the village communities were that fish landed by nkacha fishers was sold at a lower price than that landed by the local fishers using small and cheaper gears which brought in stiff competition for the market. This resulted in low cash incomes for the local fishers as their quantities landed were far less as compared to those landed by nkacha fishers. The other problem was that, with relatively higher cash incomes, the nkacha ancillary workers enticed school going aged girls, which interrupted their educational prospects.

Fed up with the situation, about March, 1995, one of the leading fishers (name withheld on request), together with his three fellow fishers from Misala beach, whose gillnets had just been destroyed by nkacha fishers, called for a beach meeting to sensitise their fellow fishers of the problem brought about by the nkacha fishers, and the dangers such nets posed to the fishery and the community as a whole. All the other fishers agreed with him and decided to report the issue to their village headman, on their intended action against the nkacha fishers, that they should no longer be allowed to fish in the lake, and that they should be chased away from the area. Having not been satisfied with the response from the village headman, they decided to approach a senior Chief (Traditional Authority) in the area. He appreciated the problems but the other junior chiefs (Village Heads) disagreed with the decision of chasing away the seine netters, because they were getting fish and money from these fishers as gifts or bribes. Seeing that things were not working out as the local fishers wanted with the assistance of the chiefs, they decided to take the matter further to the Department of Fisheries for assistance.

Towards the end of March 1995, the DoF representative based at Njelwa beach was approached by the leading four fishers, who by then had formed a pressure group which they called a fishers committee. They asked him whether it would be possible to suspend completely nkacha fishing in the lake. His failure to respond favourably to them, made the committee return to him on 28<sup>th</sup> April 1995 with a letter addressed to the District Fisheries Officer responsible for the Lake. The Committee asked the locally based DoF staff to escort their secretary to Zomba fisheries office to deliver the letter by hand and get its response. The main request in the letter was whether DoF could give them an okay and help them evict the nkacha fishers from the lake.

While the committee was trying to get support from the local leaders as well as from DoF, its members were busy conducting sensitisation meetings and going from beach to beach forming fisher groups (initially called pressure groups), which were asked to make sure that the nkacha fishers did not use their nets in the lake. The villages covered were Misala, Mthubula, Matipwiri, Mteuka, Dinji and Kalyolyo. This move was supported by a lot of villagers due to the problems the nkacha fishers brought.

Following the delivery of the letter in Zomba and the discussions that followed a general meeting was held at Njelwa beach on 17<sup>th</sup> May 1995. In attendance were the Police Officer-in-Charge for Machinga District, the District Commissioner for Machinga District, Chief Kawinga, The Member of Parliament for the area, DoF staff, local leaders, the fisher



pressure groups, local fishers and the nkacha fishers. It was later resolved at the meeting that effective that day (17/05/95), nkacha fishery should stop in Lake Chiuta.

This peaceful resolution did not work, some nkacha fishers continued to fish in the lake. This made the fisher pressure groups resort to using force to evict the remaining nkacha fishers. This took place on the night of 19 – 20<sup>th</sup> May, 1995. Following this, an emergency meeting attended by all those who came to the 17<sup>th</sup> May meeting was held on 22<sup>nd</sup> May. At this meeting, the resolution was the same, that nkacha fishers should stop fishing in the lake. However, one of the nkacha fishers was brave enough to ask if they could be given a two week grace period to enable them organise transport to get their fishing gears back to Lake Malombe. The request was directed to the fisher pressure groups by the chairman of the meeting for response. The pressure groups refused even to give them a single day. Since then no nkacha fishery has been allowed in the lake. This happened because according to the Fisheries Act, there was no fishing regulation that applied to Lake Chiuta, let alone to ban nkacha fishery anywhere in Malawi, and so DoF could not say anything. It was left to the local fishers to decide what they wanted.

After the nkacha fishers had left Lake Chiuta in May 1995, the Department of Fisheries continued to work with the same beach fisher pressure groups, which by then had become more organised and were recognised as Beach Village Committees (BVCs). However, there were still no government regulations covering the Lake Chiuta fishing activities. This was the beginning of the change from a community based fishery management to a co-management system. The DoF got more and more involved in the running of BVC activities. The first BVCs around the lake were therefore those from the initial six villages where fisher pressure groups had been formed. There are now nine BVCs around Lake Chiuta, namely; Nafisi, Mthubula, Misala, Moro, Njelwa Kalyolyo, Aduwa, Ali Chikwawa and Matipwiri.

These committees are representative bodies of one or more fisher villages that share a fishing beach. Their main tasks include: the protection and control of the exploitation of the fish stocks; making sure that the agreed and accepted fishing gears operate in the lake; guarding against the return of nkacha fishers; and settling disputes among the fishers. Membership to these committees is open to all fishers provided they are elected into office at a fishers meeting.

The Department of Fisheries provided some training to the BVCs in group leadership and dynamics. The provision of this service installed trust between the fishing communities and the DoF, and improved the relationship between the two sides. DoF then took advantage of these committees and used them as the focal points of extension message dissemination and getting a feedback from the communities.

### **Objectives of co-management**

As noted earlier, the participatory fisheries management programme in Lake Chiuta arose out of mutual relationship that developed between the two partners, the DoF and the BVCs. Evidence has it that both parties had the same overall objective of improving the livelihoods

of fishing communities by ensuring sustainable exploitation of fish resources in the lake. But as an immediate objective, both sides had different objectives for going into co-management. The communities had a far much stronger immediate objective of getting government support and recognition for their management strategy of keeping nkacha fishers out of Lake Chiuta.

From the results available, it could be said that DoF was dragged into this partnership without any immediate objective. It was only after the nkacha fishers had been driven out of the lake, that DoF developed its objectives for the partnership. These were three-fold: a) to support the community based system; b) to support the regulations formulated by the partnership; and to enhance the dialogue established between the two partners. This lack of immediate objectives by DoF when the programme was starting is evidenced later from its lack of commitment and strong support to the activities of BVCs in the initial phase of the programme. Later, this had a negative repercussion on the development of the partnership and performance of the BVCs.

Due to this lack of seriousness and weak support to the BVCs, some of the BVC members expressed disappointment in the performance of DoF towards their partnership.

## **Experiences from Lake Chiuta**

### **Lake Chiuta - Community characterisation**

Lake Chiuta is surrounded by a total of 19 fishing village communities that share the shoreline on the Malawi side. These communities are currently making use of 29 active beaches on the main land and three beaches on the three main islands of Big Chiuta, Small Chiuta and Likanye islands. This gives a total of 32 active beaches that are being utilised to land fish catches from the lake. These 19 beach villages have approximately 3,000 households, this gives an approximate populations of about 21,000 inhabitants that live along the lakeshore on the Malawi side.

Of the 19 villages, three villages were chosen at random for detailed studies that generated the information presented in this paper. These villages were Chimanda, Dinji and Makwinja. The three villages had an approximate total number of 515 households. Base on the study findings, the villages had an average household size of 7 people per household. This gave an approximate total population for the three villages of about 3,600 people. These households have an average number of 5 children per family. Dinji village is relatively larger than the other two villages and is headed by a Group Village Headman.

### **Community homogeneity**

The study revealed that the main tribes around Lake Chiuta are Lomwe and Yao. Tribal oral history in the area has it that the first people to come and settle in the area were the Lomwe who came in from Mozambique, looking for better farming land. The Yao people came in from Makanjira side, north-east of Mangochi, and since they do not like fighting,

they settled among the Lomwe by the lakeside. The two tribes have co-existed for a long time and have inter-married. The household survey indicated that the dominant tribe among the two, in terms of numbers is the Lomwe tribe. About 63% of the sampled households were Lomwe, followed by the Yao households that made up about 34%. The remaining 3% was composed of the Nyanja and Sena people. By village, Chimanda and Makwinja villages had the highest Lomwe population, 70% and 64% respectively. Whereas, Dinji was more or less equal, with 56% and 43%, Lomwe and Yao respectively.

In terms of religious affiliation, Dinji and Makwinja are both dominated by people of Islamic faith, whereas, Chimanda is dominated by Christians. Dinji and Makwinja had about 80% and 79% respectively Islamic households, and Chimanda had about 63% christianic households (see table 1 for summary of village profiles).

About 66% of the sampled households had migrated into the area, and the highest number of migrants was recorded in Makwinja village, about 71%, followed by Chimanda village, 67%. Most of those people who settled in Makwinja village had come in from Mozambique, Thyolo and Mulanje, and were primarily after farming land and fishing, later they ended up getting married in the area. Most of the settlers in Chimanda village had come in from Thyolo and Mulanje districts and were after farming land. This explains the high Lomwe presence in these two villages, as people from Thyolo, Mulanje and Mozambique are mainly of the Lomwe tribe.

Among the fishers, about 75% of the sampled fishers have lived in the area either since birth or for more than 30 years. Of the remaining 25% most of them were found to have lived in the area for a period of 1 to 9 years (17% of the total fishers). These short lived immigrant fishers were found to be the ones that moved into the area from either Mozambique or Mulanje/Phalombe areas.

### **Community's knowledge of the fishery**

Lake Chiuta has been under the control of local people with *de-facto* territorial user rights until of late, when co-management was introduced in the mid 1990s.

Following this introduction, the Chiuta fishing communities have claimed improved livelihood and enhanced food security as being due to the introduction of co-management in the area. These results are based on the premise that the Chiuta community have a comprehensive understanding of their fishery resource, such that outsiders are not allowed to introduce fishing gears that will disturb the ecological balance of the fishery resource.

### **Locally developed fishing regulations**

In this case beach seine nets are not allowed in the lake. Co-management was therefore introduced in the lake to provide legal basis for the exclusion of beach seine net fishers.

An analysis of the functions of the BVC as given by its members indicates that the BVC functions are mainly enforcement in nature. These included enforcement of fishing regulations such as:

- Use of gillnets having mesh sizes of not less than 2.75 inches
- Use of fish traps with bigger spaces
- Making sure that fishers are not catching immature fish
- Making sure that no one uses nkacha net in the lake
- Making sure that no one is using fish driving methods for gillnets (chiombera), and
- Making sure that no constructs a floating hut (chimbowera) in the lake.

### **Changes in community welfare**

In this section a brief account of each village will be given indicating how their livelihoods relate to fishing activities.

#### **Chimanda Village Community**

Chimanda village has approximately a total of 100 households, which gives an approximate population of about 500 individuals. A 10% random sample of the households revealed that household heads range in ages from 20 years to over 60 years. About 57% of these lie between 31 and 50 years of age. The sampled household had an average number of 3 children per family. Household sizes ranged from 3 to 16 people with an average of 6 people per household.

#### **Ethnic groups**

The village is composed of mainly two ethnic groups of Yao and Lomwe. The Yao being the households that are indigenous of the area (i.e. those that indicated were born in the village), and the Lomwe being those that migrated into the area, either because they were looking for better farming land or because they came there to marry. Among the consulted household heads, 30% were Yao and 70% Lomwe. Alongside this were their religious faiths. The indigenous people belong to the Islamic faith, whereas those that migrated into the area belong to different christianic faiths. In general, about 63% were Christians of different sects.

#### **Literacy**

Literacy levels in this village are very low. About 54% of the respondent household heads have never had any kind of formal education in their lives. Only 37% had done junior primary education<sup>6</sup> and about 9% senior primary education. The interesting thing was that 80% of those who had been to school were immigrants into the area.

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<sup>6</sup> Junior primary education comprises of the first five years one spends in school, where one learns the basics of writing, reading and simple numeric functions such as adding, subtracting, multiplication and division.

## **Description of the fishery**

Chimanda village has access to the lake through Aduwa beach. The beach Aduwa has of late been named after Mr. Duwa who used to be a famous fisher at the beach. The beach was originally cleared by VH Chimanda himself. Before the beach changed its name to Aduwa, it was known as “*Kamdogo*” (a Yao word meaning do not bewitch me). This word was often used by the first two famous fishers, Mr. Kwenje and Mr. Mandevu, who used the beach soon after the VH had cleared it up. These two early fishers used to say “*do not bewitch us, we are only here to fish*”. After these two fishers had phased out, Mr. Duwa came in, he was also popular, and everyone used his name to refer to the beach. Otherwise, the name of the beach is Chimanda, named after the VH who cleared the beach in the first place.

The fishery in this village can be described to be more of subsistence than commercial, although out of the little that is caught, about 90% is sold. The fishers in this village alternate between farming and fishing. During the rainy season, most fishers of the village divert their efforts to farming than fishing. They return to fishing after they have harvested their crops from May to October. During the annual frame survey (fishing gear census) carried out in September 2003, a total of 47 fishers were recorded on the beach. Of these 17 fishers were gear owners and 30 were helpers (assistant fishers or crew members). These fishers had 14 dugout canoes. The main fishing gears in this area are fish traps and gillnets, which totalled to 366 and 71 respectively. In addition to these, only 2 units<sup>7</sup> of hand lines were recorded.

However, it is not every household that has a fishing unit. About 39% of the households sampled rely on fishing and about 59% on farming. About 29% of those that rely on fishing were crew members and fish traders. About 4% have other sources of earning a living, such as petty trading and short time hires or contracts (locally known as *ganyu*) to do all sorts of odd jobs for a pay. Of the fishing gear owning households 90 percent of them rely on fishing as their main source of income, while 10% rely on farming. The main crops grown in the area are maize and rice. A few individuals also keep farm animals such chicken and rabbits. On average, household farm land size is 1.5 ha. as given by the respondents. About 73% of the respondent households acquired these farming lands by being allocated by the Village Heads, where as the remaining 27% inherited their farming land from the parents of the their wives.

## **Interface between fishers and communities**

Research results show that there is a very important link between the fishers and the rest of the village community. The village community sees the fishers among them, especially the gear owners, as very import people since they provide the village with fish for both consumption and for sale. The provision of fish for consumption was viewed in two ways. First as gifts from fisher friends and as payments in kind for the services they may render to the fishers in extracting fish from the nets after landing. Second by having easy access to fish which they buy for re-sell elsewhere.

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<sup>7</sup> A unit of long line or hand line hooks is defined as 100 hooks.

Fishers too, did indicate that the rest of the village community was important to them as they provide a ready market for the fish that they land. This, they said, reduces the risk of having the fish not sold and eventually going bad. However, the feeling fact that they are providers of fish in the village elevates their social status, and makes them feel special. As a result they tend to distance themselves away from the rest of the village community, especially during fish landing times. In addition to this they enjoy due respect in the village as gear owners, as they are considered to be financially well off.

### **Makwinja Village Community**

Makwinja village, which is situated at the extreme south-western tip of Lake Chiuta has an approximate total number of households that come to 173, giving an approximate total population of 1380 individuals. Based on this, 17 household samples were chosen at random. About 62% of the respondent household heads were aged 50 years and below. The average number of children per family worked out to be 6, and the average household size for this village community was found to be 8, although the range was from 2 to 30 people per household.

### **Ethnic groups**

Makwinja village is mainly composed of two dominant tribes in terms of numbers. These are the Lomwe who comprise about 64% and the Yao tribes who make up 28% respectively. The remaining percentage is made up of other smaller ethnic groups such as the Nyanja and Sena. Surprisingly, about 71% of the sampled households were migrants into the area, and these had come from various parts of the southern Malawi and Mozambique. An analysis on the reasons for migrating into the area did reveal that about 50% of the holds have moved into the area primarily because of fishing and eventually, they ended up marrying women from the village. About 40% of the household said they had been attracted to the village because of its fertile farming land.

Regardless of whether the households had migrated into the area or not, the dominant religious faith for the village was Islamic, consisting of about 79% of the households. The remaining percentage was made up of households that belonged to several Christian faiths.

### **Literacy**

Levels of education among the consulted households was very low, as a result, about 79% of them had no formal education that is they had never been to school. Only 16 and 5 percent had done junior and senior primary education respectively. None of them had done any secondary school education.

### **Description of the fishery**

The people in this village make use of Nafisi fishing beach to carry out all their fishing activities. The beach was named after a small hill near the beach. As the name suggests, there used to be a lot of hyenas living in this small hill, hence the hill was named after the hyenas (*fisi* meaning hyena). During the 2003 fishing gear census (frame survey) conducted around Lake Chiuta, it revealed that there were 8 fishers from the village who own fishing gears and 21 assistants. These fishers had 19 dugout canoes, and they were fishing using 256 gillnets and 117 fish traps. In addition to this, there was a total of 540 nchomanga fishing units.

This village community demonstrated that the people of the village have dual occupation, as about 52% did indicate that farming was their main source of earning income, while about 43% had fishing as the main occupation. 29 and 17 percent had fishing and farming as their secondary occupations respectively. An equal percentage of 21% did indicate that fishing or farming was their only source of earning a living and nothing else.

### **Interface between fishers and communities**

The role of fishers in Makwinja village is very crucial in that they are seen as people who help in the development of the village. Three dimensions of fisher importance were isolated. First, they are providers of fish to the community, both for consumption and for re-sell. Second they provide employment to the people of the village, either as assistant fishers, or as gardeners in their fields during cultivation period. Thirdly, they either provide soft loans to their village mates, or due to their elevated social status in the village, they assist friends and relatives when there is a funeral. Likewise, the fishers view the village community as important as they provide a ready market for their fish, and also as they supply fishing labour whenever needed.

### **Formation and composition of BVC**

The BVC in Makwinja village is known by the name of the fishing beach, Nafisi. This BVC was officially formed in July 1995, with the initiative from the DoF, as a follow-up to the formation of similar committees to the north of the lake. It caters for fishers from two other villages of Majawa and Limera. Initially, it was made up of 10 village members and one Village headman, who for some reason or another, were all non fishers. The argument in favour of such a composition as put forward by the committee chairman was that you can not have fishers in the committee to enforce fisheries regulations against their fellow fishers.

### **Dinji Village Community**

Dinji village has an approximate number of households that amount to 242. Roughly this gives a total population of 1210 individuals for the village. As a result, 24 households were sampled at random. Based on the responses from the sampled households, 50% of the household heads were below the age of 50 years. The average number of children per family was found to be 6 children, although the range was from 0 to 10 children per family. There was not much difference between the family size and household size. On

average the household size was found to be made up of 7 people, with a range of 3 to 14 people per household.

### **Literacy**

There are high illiteracy levels in this village community. 72% of the respondent household heads had never had any formal education in their lives. Unfortunately, 100% of those who had been to school, had only done junior primary school. None of the respondents had either done senior primary school education or secondary school education.

### **Description of the fishery**

The people in this village make use of Njelwa fishing beach to carry out all their fishing activities. During the 2003 fishing gear census (frame survey) conducted around Lake Chiuta, it revealed that there were 8 fishers from the village who own fishing gears and 4 assistants. These fishers had 3 dugout canoes, and they were fishing using 183 gillnets and 12 fish traps.

### **Ethnic groups**

Dinji village community is mainly made up of two dominant ethnic groups, the Lomwe and the Yao. Based on the survey results, about 56% of the respondents were of Lomwe origin while 43% were Yao. The other ethnic group present in the village was the Nyanja that formed only 1%. There were equal proportions of households that indicated were indigenous of the area between the Yao and Lomwe. For those that indicated had migrated into the area, 40% were Yao and 60% were Lomwe. In general, however, a larger proportion of households (59%) indicated that they had migrated into the area. Despite the differences in the ethnic groups, about 80% of the respondent households were Islamic and only 20% were of christian faith.

### **Dependency on the fishery**

This community demonstrated dual occupation, although there is relatively high dependency on fishing. They depended both on fishing and agriculture. To most fishing was their main occupation during the off-farming periods. Only about 56% had fishing as their main source of livelihood, and out of these 54% had no any other source of income apart from fishing. 36% had farming as their primary occupation, with fishing as their secondary source of income.

In summary, the people around Lake Chiuta have what could be classified as dual occupation. They depend both on the fishery as well as on agricultural production. On average, based on the consulted households, about 45% of the people primarily depend on fishing, and about 49% on agricultural production. The remaining percentage depend on other sources such as petty trading and as hired workers. The dependency intensity on either fishing or agriculture varies from village to village. For example people of Dinji



village depend more on fishing, about 56% than those of Chimanda and Makwinja. Inversely, Chimanda and Makwinja villages depend more on agricultural production (59% and 52% respectively) than Dinji village (refer to table below).

**Table 1: Summary of village profiles on household and livelihood characteristics**

Characteristics	Name of village			Remarks
	Chimanda	Dinji	Makwinja	
<b>Household characteristics</b>				
Number of households	100	242	172	Total : 515
Average household size	6	7	8	Avg.: 7
Average number of children per family	3	6	6	Avg.: 5
<b>Ethnicity</b>				
Dominant tribes:	%	%	%	Average %
Lomwe	70	56	64	63
Yao	30	43	28	34
<b>Dominant religious faith:</b>				
Islam	37	80	79	65
Christian	63	20	21	35
Indigenous of the village	33	41	29	34
<b>Literacy</b>				
Never been to school	54	72	79	68
Been to school only did Junior Primary Sc.	80	100	76	85
<b>Sources of livelihood</b>				
Dependency on fisheries	37	56	43	45
Dependency on farming	59	36	52	49
Depend on other sources	4	8	5	6

### **Relationship between Participatory Fisheries Management (co-management) and people's livelihoods and food security**

The introduction of co-management in Lake Chiuta was primarily for better management of the Chiuta fishery through fisheries conservation. The focus of the fishers and the rest of the community members was to see sustainable resource utilisation based on their set fishing regulations. Most of the respondents in the study indicated that careful resource harvesting now would enable their children in the future utilise the same resources for their livelihoods.

About 80% of the respondents indicated that catches started to improve three to four years after the introduction of co-management in the lake. This was attributed to the increase in number of gillnets and fish traps being used in the lake. During the same period, a new fishing gear was developed that was called nchomanga, and by the time the 2003 frame survey was being carried out, there was a total of 540 nchomanga gears.

The claims made by the fishers and the rest of the fishing communities about the improvement if the fishing catches was substantiated by looking at the fish catch statistics for the period 2000 to 2003. This catch data is given in table 2 below.

**Table 2: Lake Chiuta Fish landings (mt)**

Species	Year		
	2001	2002	2003
Makumba	183.05	501.12	587.72
Matemba	7.04	0.58	121.63
Mlamba	51.4	103.38	83.76
Others	817.3	669.8	354.57
<b>Total</b>	<b>1058.79</b>	<b>1274.88</b>	<b>1147.68</b>

In terms of livelihoods and contribution towards food security, the data in the above table was subjected to the average beach prices for each species and tables 3 and 4 were generated.

**Table 3: Lake Chiuta Fish Prices (MK/kg)**

Species	Year		
	2001	2002	2003
Makumba	65.28	51.73	86.61
Matemba	23.32	21.99	37.48
Mlamba	16.20	21.57	23.62
Others	17.02	11.79	9.13
<b>Total</b>	<b>121.82</b>	<b>107.08</b>	<b>156.84</b>

**Table 4: Lake Chiuta Total Fish Values (MK)**

Species	Year		
	2001	2002	2003
Makumba	11,949,504	25,922,938	50,902,429
Matemba	164,173	12,754	4,558,692
Mlamba	832,680	2,229,907	1,978,411
Others	13,910,446	7,896,942	3,237,224
<b>Total</b>	<b>26,856,803</b>	<b>36,062,540</b>	<b>60,676,757</b>
<b>US \$ equiv.</b>	<b>193,214</b>	<b>259,227</b>	<b>436,523</b>

Table four above proves the point that the overall fishing community income around the lake kept on increasing yearly. However, the fishers' income depends on the extent of the

market forces at the beach. This basically hummers the point home that the livelihoods of the fishing communities and food security kept on improving every year. This point is further illustrated through the experiences in the 2004-2005 farming season when there was a widespread drought in Malawi, whereby farmers did not harvest enough crops. The fishing community in this area, though it was difficult to get the local staple food, maize, they had enough income from fishing to source food from other areas, a thing that was not going to be possible if they were not earning enough from fishing activities.

## **Conclusion**

The results of this study have indicated that, although co-management was introduced to sustainably manage the fishery resources, the end result has been the development of sustainable livelihoods and enhanced food security. In summary therefore, the policy implication from this study is that co-management should not only be viewed as a resource conservation approach but also as a development strategy. When planning to implement co-management in any natural resource management, socio-economic issues affecting the resource users should be taken into consideration.

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