

FISHERIES CO-MANAGEMENT IN MALAWI: LAKE CHIUTA RE-VISIT CASE STUDY

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Abstract

A re-visit study was conducted with an aim of assessing characteristics of the Lake Chiuta Fisheries Co-management arrangement. For local level institutions called Beach Village Committees (BVCs), social status, material benefits and the ability to keep *nkacha* fishers out of Lake Chiuta were major incentives for their partnership with the government. Government considers the partnership as being essential for ensuring sustainable utilisation of the resource and in this sense has increasingly taken advantage of the organised BVC structure to channel its management messages. The common sources of conflicts on the lake are gear theft and the struggle for power over the resource between BVCs and chiefs, which are dealt with by beach chairmen, BVCs and local leaders. Although most of the people in the community know about the existence of the organised structures, inequities in terms of distribution of benefits from the resource and representativity of the BVCs and the other structures largely persists. Indications are that so long as the threat of *nkacha* fishers gaining access into the fishery exists, mobilisation of the fishers will remain strong. The fact the fishers initiated the organisation for management on their own remains the best foundation for sustainability of the arrangement.

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1. Introduction

Since the colonial rule, fish resource management in Malawi has been based on a centralised approach. Management decisions have been made without consultations with the user community. Biological considerations were major inputs and formed a basis for policy formulation, legislation and resource management guidelines. Studies on the socio-economic spheres of the resources users with considerations on their indigenous knowledge were irrelevant as far as management of the fisheries resources was concerned. Consequently, fish resources have been considered state-owned and there has been a great demand for resources to enforce fisheries regulations, which has been an uphill task taking into account limited budgetary provisions for such activities.

However, there has been an emerging interest in the involvement of the user community in fisheries management since early 1990s. Fisheries socio-economic research has also been a focus to augment initiatives within a co-management framework. This co-management arrangement is just another optional management strategy. On Lake Malombe fisheries co-management has been on a pilot basis since 1993. Two years later, some community based fisheries management programmes were initiated on Lakes Chilwa after recession and on Lake Chiuta after an influx of *nkacha* seine fishers who were considered responsible for decline in landings of indigenous fishers.

As part of the Fisheries Co-Management Project Re-visit in Malawi, a field study was conducted with an aim of evaluating the Lake Chiuta Fisheries Co-Management Programme (LCFCP). This re-visit study followed a framework that was discussed during the Maputo workshop held in November, 1998.

The re-visit study was conducted to examine the patterns of interactions among various stakeholders such as the local level institutions called Beach Village Committees (BVCs), association, local leader, Fisheries Department (FD) and the community as a whole. The study also assessed the incentives of co-management with respect to the stakeholders. The outcomes of the co-management arrangement in form of efficiency, equity and sustainability were assessed.

1.1 General characteristics of Lake Chiuta

Lake Chiuta is a shallow lake of a mean depth of 5 m and is shared between Malawi and Mozambique. It is located at an altitude of 620 m in the southern part of Malawi. The mean depth of the lake is 5 m and has a total surface area of about 200 km², of which 49 km² lie in Mozambique (FAO, 1994). The southern part is more or less permanently covered with emergent vegetation penetrable by canoes but not larger craft. The waters are clearer and less saline than those of Lake Chilwa.

Although Lake Chilwa is a closed lake (Lancaster, 1979), there is good geological and biological evidence that during the late Pleistocene, Lake Chilwa was connected to Lake Chiuta and the Lujenda River, which drains to the Indian Ocean. The lakes are estimated to have separated within the last 15,000 years. Dissi and Njaya (1995) reported that the fish resource management system of Lake Chiuta was until mid-1990s based on a traditional

setting whereby local leaders were entrusted with a role to allow fishers exploit the resources in the lake.

The lake has a number of islands such as Big Chiuta, Small Chiuta, Nthambalale, Njiriti, Nanyowe, Likanye, Phiri la nsatsi. In times of high water levels such as in 1977 and 1978, Kumbanga and Koloko hills become surrounded by water. Big Chiuta is important for fishing activities for migratory fishers who sometimes temporarily dwell on the island while processing their fish before transportation to mainland. Along the Malawian shore line, Lake Chiuta has a number of active beaches which are more than twenty three. Seasonal migratory patterns are observed due to existence of marshes. Fishers migrate from the southern beaches such as Nafisi to the northern areas like Small Chiuta island around June/July when low water levels are experienced.

Lake Chiuta is fed by a number of affluent streams and is sometimes connected by a swampy channel to Lake Amaramba, from which flows Lujenda River, a major tributary of Ruvuma River. The major affluent rivers include Lifune, Chitundu and Mpili rivers. Lake Chiuta's associated marshes are separated from those of Lake Chilwa by a sand bar of about 20 m higher than the present lake levels.

In its annual report, Fisheries Department (1971) indicated that it was still not possible to carry out any fisheries work on this lake as the lake is sufficiently remote and relatively unimportant that the Department had been unable to give it any priority. The report estimated an annual fish production of 200 tonnes since 1963 till 1960s. However, from 1976 to 1996, fish catches from Lake Chiuta averaged around 2000 tonnes.

Chiuta communities are also farmers. They produce cereal crops such as maize (staple food), rice and sorghum. In a way to promote rice farming, a rice scheme was established to train the local farmers in rice production for higher yields. Livestock and poultry production is also practised to a limited extent.

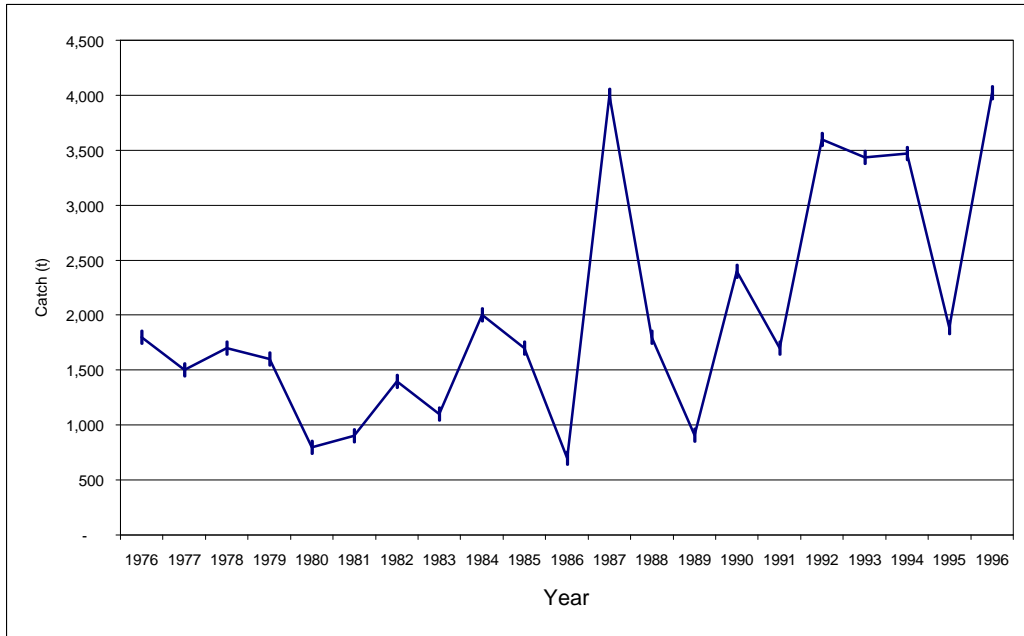


Figure 1: Annual Fish Production for Lake Chiuta

1.2 Bio-technical and physical characteristics

Donda (1997) reported that Lake Chiuta is a multi-species fishery which has physical boundaries determined by the position of the lake. The resources are mainly sedentary although there is evidence of migrations. The lake habitat is less degraded than most, with muddy bottom and submerged vegetation.

Table 1: Summary of bio-physical and technical attributes of Lake Chiuta

Attribute	Indicators and Explanation
Resource boundaries	Physical
Type of fishery	Multi-species
Migratory or Sedentary	Sedentary with limited migration between open water and marshy areas
Species harvested	Major species: <i>Oreochromis shiranus</i> , <i>Tilapia rendalli</i> , <i>Clarias gariepinus</i> , <i>Barbus paludinosus</i> , <i>mphuta</i> and <i>nkhalala</i>
Technological changes	Artisanal for both subsistence and commercial fishing. Mainly use dug-out canoes and a few planked boats. Changes have also been noted on the use of gill nets from traditionally use of <i>chopwa</i> netting material from trees. Fish processing is sometimes done by using chorkor kilns for efficient use of fuelwood.
Fishing gear	Gill nets, fish traps and long lines and individually placed hooks locally termed as <i>nchomanga</i>
Condition of habitat	Lake bottom is muddy with submerged vegetation. There are open water and marshy areas. Influent rivers also provide suitable habitat for riverine fish species.

Adapted from Donda (1997)

Table 2: Market attributes

Attribute	Indicators and explanation
Subsistence or commercial fishing	More than 90% of the catch is sold
Market structure	Fish is bought at wholesale prices (fresh or dried/smoked) and in turn sold in various places including surrounding areas and urban centres The majority of fish traders are men (about 80-90%)
Market orientation	Local and inland markets such as Machinga, Ngokwe, Liwonde, Balaka, Phalombe, Zomba and Blantyre Fish is transported by use of bicycles, private vehicles and others carry baskets/bags of fish on their heads
Market chain	Fisher-middlemen (one to three)-consumer
Product value	Average to high Product value depends on forces of supply and demand and quality

Adapted from Donda (1997)

Table 3: Socio-economic characteristics

Attribute	Indicators and explanations
User homogeneity/heterogeneity	Lomwe and Yao ethnic groups
Dependence on fishing for subsistence and commercial	Very high. Large proportion of fish caught is sold for cash (90%)
Household size	Relatively high. Average of nine members per household
Degree of user motivation	Commercial fisheries
Attitudes towards risk, innovation, collective action	Strong
Level of information and knowledge of the fishery and its management	Local indigenous knowledge available

Adapted from Donda (1997)

The lake is characterised by artisanal fishers who operate using either dug-out or planked canoes for both subsistence or cash. In terms of fishery development, the lake has not received any significant recognition by the Fisheries Department until recently (around mid-1970s) when the lake was divided into two minor strata (Dinji and Saleya) for the purpose of data collection.

The main fish species caught include *Oreochromis shiranus* (*makumba*), *Tilapia rendalli* (*chilunguni*), *Clarias gariepinus* (*mlamba*), and *Barbus paludinosus* (*matemba*). The fish is largely caught by gill nets, long lines or individually placed hooks (*nchomanga*), and fish traps. The fishery is dominated by gear owners who are also fishers. There are very few ancillary workers at present as opposed to 1980s and early 1990s as seining has not allowed on the lake, especially since 1995 after the co-management programme. In terms of technological changes, the fishery has experienced introduction of planked canoes and netting materials for gill nets. There have also been some changes in fishing methods such as introduction and banning of open water seining.

Table 4 : Annual frame survey results for Lake Chiuta

Year	Area	Gear owners	Ancillary workers	Fishing craft		Main fishing gears		
				Planked boats	Dug-out canoes	Fish trap	Gill net	Long line
1995	Saleya							
	Dinji							
1996	Saleya	538	24	9	434	6835	1964	129
	Dinji	424	82		291	6515	778	252
1997	Saleya	338	28	6	245	3751	1955	29
	Dinji	382	44	2	252	2743	3189	24
1998	Saleya	450	7	3	254	6384	1867	5
	Dinji	381	79	10	222	3556	1035	50

As Table In 1998 there were 831 gear owners and 86 ancillary workers operating on the lake. The fishing operation is either done on part-time or full-time basis. Crop farming is an alternative form of employment to the Lake Chiuta community, especially during rainy season.

No substantial research has been conducted on Lake Chiuta apart from the catch assessment survey. The fishers, however, are knowledgeable about the ecological and biological

characteristics of the fishery especially in terms of seasonality, spawning patterns, and fish migratory patterns between the open water and marshy or swampy areas. The fishers also know which areas and type of gear should be used to target specific species.

2. Methodology

Several sources of information were used during the study. Primary and secondary data were gathered through discussion. Interviews were conducted in all the nine BVCs along Lake Chiuta. The Lake Chiuta Association was also interviewed. One Chief, two Group Village Heads and four Village Heads were individually interviewed as a stakeholder group. Two groups of fishers and randomly identified community members were also interviewed to assess how the BVCs are considered by villagers. As a secondary stakeholder, local based FD extension staff were interviewed to assess expectations of the Government in the co-management arrangement.

Experience of the authors was used to support any historical explanation given by the respondents as most information was based on recollection and not documented. The ongoing PhD study for one of the authors also provided some useful information especially on the socio-economic characteristics of the fishing community and the bio-technical attributes of Lake Chiuta fishery.

3. Historical background to Lake Chiuta Fisheries Co-management

Before the *nkacha* seining was introduced in Lake Chiuta around early 1990s, the fishery was as good as is the case now. The fisheries employed were mainly gill nets (1½"-2¾" mesh size) for targeting *nkhalala*, *chambo*, *chilunguni*, *zilenje* and *mphuta*; fish traps for *matemba* and *zidondolo* and longlines for *milamba*. The most common craft used on the lake has been dug-out canoe.

With the introduction of *nkacha*, fish catches began to decline. Secondly the size of *chambo/makumba* also started to get reduced. Other problems associated with the *nkacha* fishery were that the *nkacha* ancillary workers caused some social problems by enticing school-going aged girls which interrupted their educational prospects; fish landed by *nkacha* fishers was sold at a lower price than that landed by the indigenous fishers using small and cheaper gears which brought in some competition; the *nkacha* fishing operation could destroy small gears like gill nets belonging to the indigenous fishers and lastly the operation of the *nkacha* fishers in the open water made water turbid and hence rendering the water unsafe for drinking by the fishing community.

With the problems above, a pressure group with an initial membership of 4 people was set up after 4 gill nets belonging to the indigenous fishers were destroyed by the *nkacha* operation early 1995. A campaign was therefore commissioned to remove the *nkacha* fishers from Lake Chiuta. The pressure group launched a complaint against the *nkacha* fishers to VH Kunawanga. However the complaint did not receive any positive response, as it appeared that the *nkacha* fishers got some favours from the local leaders as the fishers were arriving on the beaches along the lake. From there the pressure group while mounting their campaign along the whole lakeshore to get the *nkacha* out of Lake Chiuta, it went to the Fisheries Office where it was advised to contact the TA Ngokwe (then sub-TA). Still there was no action from

the higher authority despite promising the group that a meeting would be held to address the problem.

Therefore a letter was written to the Regional Office in Zomba. A meeting was then arranged attended by the Police Officer-in-Charge for Machinga District, Chief Kawinga, fisheries staff, local leaders, the pressure group and other fishers. The meeting was held at Njerwa and an agreement reached was that the *nkacha* fishers should go back to wherever they came from within two weeks. While some *nkacha* fishers heeded to the call, others were resisting until a confrontation was reached. By May, 1995 all *nkacha* fishers were driven back to wherever they came from and since then there has been an enforcement of the ban of *nkacha* on Lake Chiuta. The fishery has recovered reaching the same levels as the time before the introduction of *nkacha*.

After eviction of the *nkacha* fishers from Lake Chiuta the Fisheries Department, as a way of appreciating the role the pressure group did advised them to form BVCs along the lake with a view to participate in the management of the resources. The fishers with satisfaction welcomed formation of 9 BVCs namely; Nafisi, Mthubula, Misala, Moro, Njerwa, Kalyolyo, Aduwa..... The FD exposed the BVCs to what was going on Lake Malombe with respect to the PFMP through study tours and a training course for the BVCs was held in 1997 but appeared not useful as there was no allowances paid out to the participants attending the ‘seminar’ which is usually the case. Secondly, there is relationship between the FD and the BVCs although it may be considered that the FD was coming to our side in good faith, it could also be said that the FD was coming with a hidden agenda.

4. Main stakeholders and their interests

In this paper stakeholders are defined as those people like gear owners, fishers or crew members and traditional leaders and local based fisheries extension officers representing the Government who are involved in the exploitation and utilisation of the Lake Chiuta fisheries resources and participate in resource management. In Lake Chiuta co-management programme, the key stakeholders are divided into two categories. These include the following:

- (a) Primary stakeholders: FAO (1998) defined primary stakeholders as those with a direct interest in the resource, either because they depend on it for their livelihoods or they are directly involved in the exploitation in some way. In case of Lake Chiuta co-management arrangement, these include gear owners who derives their earning from fishing and ancillary workers or crew members who provide their supportive services in form of employment to the gear owners.
- (b) Secondary stakeholders: According to FAO (1998) secondary stakeholders would be those with a more indirect interest, such as those involoved in institutions or agencies concerned with managing the resource or those who depend at least partially on wealth or business generated by the resource. In Lake Chiuta co-management programme these secondary stakeholders would include FD, BVCs, association as institutions and fish processors and traders. However, when the BVCs and association are considered in terms of individual members as fishers then they become primary stakeholders.

4.2 Management tasks

The sharing of task responsibility between the BVCs and the FD in the fisheries co-management arrangement is not equal. The majority of the BVCs indicated that the BVCs do more work than the FD. Their level of participation was on average placed at around 70% against 30% for the FD. The following are the major management tasks implemented by various key players in the Lake Chiuta co-management programme.

Table 5: Responsibility sharing arrangement in the Lake Chiuta Co-management

Management Task	Responsibility Sharing Arrangement				
	Govt-based	Consultative	Co-operative	Delegated	Community-based
Legislation					
Review of Fisheries Act					
Formulation of regulations					
Enactment of Fisheries Bill					
Enforcement					
Expulsion of <i>nkacha</i> fishers					
Ban on use of <i>nkacha</i> seine					
Mesh sizes					
No seining					
Immature fish					
Prosecution					
Controlling access to fishery					
Information sharing					
Loan management					
Distribution					
Loan recovery					
Licensing					
Collection of licence fees					
Issue of licences					
Conflict resolution					
Resource monitoring					
Indigenous knowledge					
Catch data collection					
Frame survey					
Data analysis					

5. Decision-making arrangements

5.1 Power Structure

Traditional structure

Several households heads which may be of related kinship or not make up a village. In turn, these villages form a group village headed by a group village headman. From this hierarchy

then comes a traditional authority, which looks after several group village headmen. A traditional leader, may be either a man or woman.

Lake Chiuta has until mid-1990s been controlled by traditional leaders. All fishers in beaches were in committees who could approach their chairman if there were any problems. Most common problems were fishing gear thefts and misbehaving either towards local leaders by not respecting them or recognising them through provision of catch shares or towards fellow fishers by interfering with other men's wives or girls. However, the chairmen are still in existence despite formation of the beach village committees. Traditional powers in controlling Lake Chiuta fishery are not quite strong in the advent of beach village committees. The BVCs have been viewed by local leaders as sources of conflicts in terms of power and recognition. The practise of honoring local leaders by giving them some fish now lies in the hands of the BVCs. Whilst this practice is still being reported, it is not as it was before the co-management was set up. One local leader (Makwinja) reported that although he goes to Nafisi beach to check what goes on there in terms of fishing activities, he does not ask for fish; what he gets is what is at the mercy of the fisher whilst in the past he could be given fish as a way of respect. Thus co-management has eroded respect for the traditional leaders.

Development structure

In terms of development, the Area Development Committee (ADC) responsible for developmental activities in a traditional authority. The District Development Committee (DDC) is a higher body within Machinga district in which Lake Chiuta is found. It is responsible for identifying project areas from different places. Against each development committee, is an executive committee responsible for technical advice and project appraisals identified by the local leaders, hence an Area Executive Committee (AEC) and District Executive Committee (DEC).

However, the new Local Government Act (1998) has provision for assemblies (for each district, town or municipality) consisting of one member elected from each ward within the local government area; traditional authorities and sub-traditional authorities from the local government area as non-voting members (*ex officio*); Members of Parliament from the constituencies that fall within the local government area as non-voting members; and five persons as non-voting members to be appointed by the elected members to cater for the interests of such special interest groups as the Assembly may determine. Among others, the Assembly shall from the constituencies that fall within the local government area as non-voting members; and five persons as non-voting members to be appointed by the elected members to cater for the interests of such special interest groups as the Assembly may determine. Among other duties, the Assembly shall make policy and decisions on local governance and development for the local government area. The Act also provides for the Assembly to take charge of decentralised services and activities, which include among others, crop, animal husbandry and fisheries extension services, forests and wetlands management. The Local Government Act is being sensitised to all communities and may become effective soon.

5.2 Representation

Representation of interest may be looked at in several ways. In the Lake Chiuta co-management programme the key partners include the fishing community and the Government. The fishing community includes fishers, local leaders and their local based institutions whilst the Government mainly refer to the extension staff working in the area. However there are some stakeholders like non-governmental organisations working for the development of the fishing community but are not represented in the co-management arrangement like the Lutheran Church which is involved in construction of feeder roads. In a remotest area like Lake Chiuta, the role of these development-centred organisations should be recognised. This study had, however, limitations to look at representation in this sense.

The way representation was tackled in the study was by looking at how interests of the fishers were represented by their local institutions (BVCs and association). The principle behind was to examine how legitimacy in terms of the existence of the BVCs and fishing regulations may be achieved. Once the fishers recognise the roles of the BVCs and participate in or are given an opportunity to express their interests this may result in their socio-political and economic empowerment. This is because the democratic principles are applied when setting up the local institutions and economically empowered through equitable, efficient and sustainable utilisation of the resource.

Fishers

Out of three groups of fishers (Aduwa, Misala and Nafisi) interviewed, two groups (Aduwa and Misala) indicated that the BVCs represent interests of the fishers whilst Nafisi fishers explained that they are not represented neither do they recognize existence of a BVC on their beach. An observation made was that Nafisi beach is far away from where the pressure group started (Misala) and Njerwa fisheries office. It was explained that it was also difficult for the extension staff to visit them on a monthly basis. It therefore shows that where the *nkacha* problem was identified and being closer to the fisheries office for guidance, the fishers still recognise the roles of the BVCs and the initial pressure groups.

However, there are some threats which may affect cohesiveness of the BVCs as the members in the BVCs have never been changed and some fishers expressed loss of trust in some of the members. The main issue at present is poor recovery of the loans, which the fishers got from FD through MAGFAD Project in 1997. Election of new office bearers appears not widely supported, as it is believed that the poor loan recovery is due to incompetence of the incumbent BVCs members. Considering the fact that some fishers are still waiting for their loan packages as a way of promoting equity is distribution of loans to the fishing community.

Another point is that the migratory patterns observed among some fishers, may sometimes make it difficult for the fishers to know what is happening on those beaches especially when the area is not accessible to extension staff and the BVC members are not very active such as Nafisi.

Beach Village Committees

About 70% of the BVCs interviewed indicated that they represent interests of fishers while around 20% explained that they represent interests of both fishers and Fisheries Department. This is mainly explained due the fact that at the time when the pressure groups were actively

involved in mobilising the indigenous fishers to evict the incoming *nkacha* fishers, communication among the fishers was done by themselves. Through the pressure groups, the fishing community was just seeking support from the Government on how best they could approach the issue. However after the *nkacha* fishers were chased away, the FD intervened with new proposals such as formulation of regulations, formation of BVCs, training in group leadership and business management and loan packages. Therefore when both cases (origin of co-management by communities) and subsequent intervention by FD are considered, it really supports the argument that the BVCs represent both the fishers and FD.

Association

The Lake Chiuta Association indicated that it represents the interest of both the FD and the fishers through the BVCs. However, the challenges that they have been experiencing mainly in terms of understanding the co-management concept, their roles in the set-up and how they interact with the BVCs, fishers, local leaders and FD it still remains an organisation whose presence has not been greatly recognised by the fishing community. It is only the FD that recognises the role of the association as the idea to form the institution came from the Government and the BVCs were just consulted on this during their training in 1997.

5.3 Communication

Fisheries extension messages are disseminated through a number of channels. There are meetings, which are of three types: (a) BVC meetings (b) BVC-fishers (c) FD-fishing community and (d) local leaders meetings.

(a) BVC meetings

The majority of the BVCs (90% of the interviewed BVCs) conduct meetings for either once or twice a month. A BVC Chairperson can organise a meeting but agenda can be drawn up by anybody who has an issue for discussion. In many cases messages or issues tabled for discussion may include fisheries regulations, allegations of migrating *nkacha* fishers, conflict resolution due to fishing gear theft cases, loan repayments, sanctions to apprehended, financial contributions, and as of late they have been discussing control measures of water hyacinth which has been noted in other water bodies and the fishers are trying to suggest some control mechanisms such as checking nets before they are operated in Lake Chiuta.

In case there are some differences to reach any conclusion of any issue being discussed, resolution is reached by considering views of the majority. However, an issue may be referred to a local leader if the BVC discussing the issue have failed to reach a compromise. In most cases issues affecting Lake Chiuta boundary (especially on the Mozambican side where reports indicate that some leaders allow *nkacha* fishers to operate in the lake) and sanctions to be imposed to some illegal fishers are refereed to either a Group Village Head or a Traditional Authority.

(b) BVC-fisher meetings

A substantial number of BVCs (about 70%) conduct these meetings once a month. They discuss fishing regulations, loan repayment, conflicts within the fishing community, in some

cases contributions towards their social funds and accountability of the funds such as assisting bereaved fishing families and extension messages from the FD.

(c) FD-fishing community meetings

These are meetings called by an extension worker. In most cases issues discussed include loan repayment, general extension messages (fish processing, water hyacinth control and licensing of gears, importance of participatory approaches to resource management etc). The meetings may also be held when there are some issues to resolve such as *nkacha* operations in the Mozambican side or when the FD is organising a meeting involving all BVCs in terms of training. These are held four times a month but the problem is that with resource limitation the extensionist may always meet BVCs which are closer to his office.

(d) Local leaders-fishing community meetings

A Traditional Authority leader may advise FD or association or any BVC to hold a meeting to resolve a certain issue. It may be an issue of a transboundary nature or where a certain village head has been reported of corruptive measures. These meetings are held on an *ad hoc* basis.

Other channels of disseminating extension messages

Extension messages are sometimes disseminated through radios. An on-going fisheries programme sponsored by GTZ and irregular publication of *Usodzi wa Lero* newsletter and distribution of extension campaign T-shirts to BVC members contribute to the media being employed in Lake Chiuta co-management programme.

Vertical and horizontal channels of communication

Information can flow in both vertical and horizontal channels depending on how important the information is and its impact on the lives of the fishing community would be. For example at the time of evicting the *nkacha* fishers, the majority of the fishers were informed as the pressure group kept on visiting the beaches and mobilise the fishing community to take action. It is also in the same context that whenever there some new fishers have been observed operating illegal fishing gears such as *nkacha* open water seine nets, information quickly gets disseminated to most of the BVCs and the FD's district office in Zomba. A quick action is also taken by some BVCs who have seen the illegal fishers.

Fisheries extension messages are disseminated amongst the fishing community through meetings with BVCs. It is expected that in turn the BVCs should contact their respective fishers. However, it was reported that not all BVCs pass on messages to their fishers, neither do the extension workers contact the BVCs regularly. It was found that about 70% of the interviewed groups of fishers reported that they are not contacted by their BVCs. One group of fishers at Nafisi beach claimed that they do not even know their BVC members, how they operate and why they should be in existence.

6. Incentives for co-management

Fishing community

The findings of the revisit study revealed some different observations on the incentives of co-management. These differences are due to various sections of the community such as community at large, fishers, local leaders and BVCs. The following table, summarises the results on what incentives are being considered by the community.

Table 6: Incentives of co-management as presented by various stakeholders

Stakeholder	Incentive to co-manage
Fishers	<ul style="list-style-type: none"> • Assist in ensuring compliance of fisheries regulations in Lake Chiuta • Loan provision
BVCs	<ul style="list-style-type: none"> • Good fish landings • Social status within community • Ensuring that fishing regulations are complied with by all fishers • Benefits such as loan packages and other materials (campaign materials such as T-shirts) •
Local leaders	<ul style="list-style-type: none"> • Material benefits • Attending seminars/workshops • Popularity among local leaders in Malawi as there appears to be some form of competition on how local leaders take part in resource management
Fisheries Department	<ul style="list-style-type: none"> • Increasing income among fishing communities • Promotion of dialogue through local community participation concept among the various stakeholders • Conflict resolution

Fishers

The fishers consider compliance of fishing regulations as the main form of incentive to participate in fish resource management of Lake Chiuta. Since they view BVCs as policing officers it shows that their participation is not based on a democratic principle but rather on fear. They are aware that once they are caught violating the fishing regulations they may be evicted or sanctioned in one form or another. In some cases they have high expectations in terms of obtaining loans which were wrongly publicized when the BVCs were being formed. To qualify for loans, messages passed on to the fishing community were centred on group formation in form of BVCs and compliance of fishing regulations, licensing of their fishing gears and training in business management. However, after the first loan scheme was administered, poor loan recovery still appears to be a potential source of conflict between the fishing community and FD. The problems of loan recovery may be due to two reasons: firstly, inadequate capacity for the FD in loan management; secondly the FD made a mistake by introducing the loan issue into the co-management programme at a wrong time as it was during the setting up of the programme and it was taken as a campaign tool to win participation of the fishers. In general the FD was too quick to introduce certain measures before it could study their implications on the co-management arrangement.

Beach Village Committees

The incentives for the BVCs were found to vary a little depending on how far they are from where the pressure group started and also how far they are from the local based fisheries office. For example, BVCs from Misala and Mthubula (from where the pressure group was formed) and those closer to the office such as Aduwa BVC consider two major forms of

incentives, namely: recognition within society and improved fish resource conservation through compliance of regulations. They want good catches to be realised by the fishers operating in Lake Chiuta. In a little varied situation, however, Nafisi BVC which is very far away from the office mainly considered expectations in the provision of some benefits by FD as the main form of incentives. They expect training, provision of transport and uniform to be recognised as BVCs to be provided by the FD. This show that Nafisi BVC was formed just because the members (who have never been changed since elected) were enticed by some messages such as loans, training seminars and study tours and not understanding their roles in the co-management programme.

Local leaders

The local leaders expect some material benefits from the FD. After formation of the BVCs there were some high expectations from the local leaders due to messages from FD. The local leaders were conducted to a number of study tours, they attended several workshops and there was a perceived competition among local leaders along water bodies in terms of their contribution towards resource management as enshrined in the new Fisheries Conservation and Management Act. The problem was that the FD did not think of sustainability of such benefits as were in fact advocated by the GTZ funded Malawi Germany Fisheries and Aquaculture Development Project. It is now just four years after the BVCs were formed and the expectations of the local leaders from the MAGFAD Project are still being reported. This could also be another potential source of conflict between FD and the local leaders.

Another point is that the expected benefits from the FD through the MAGFAD Project were perceived by the local leaders as alternative to free fish hand-outs as was demanded from any fisher landing catches on beaches. The co-management arrangement has also eroded respect of the fishers towards the local leaders hence the benefits from the FD were a means to gain their recognition within and outside their areas.

Fisheries Department

The FD as a co-managing partner has some basic incentives to co-operate with the fishers through the BVCs. Firstly it is in line with the local community participation concept as stipulated in the Fisheries Conservation and Management Act that brings in the consultative process as an incentive to co-manage. Secondly, by being recognised by the fishing community, the FD has considered that an opportunity to popularise its potential in conflict resolution as it assisted in the eviction of *nkacha* fishers. This means that for its existence within the fishing community is greatly recognised by the fishing community and hence any extension messages or consultative formulation of regulations would increase legitimacy of such regulations. Thirdly, it is within the mandate of FD that an increase in income and provision of employment opportunities to rural communities are realised as means to achieve the goal of poverty alleviation policy in Malawi.

7. Regulations, sanctions and conflict resolution

7.1 Regulations

The following Table indicates formal and informal regulations governing exploitation of fisheries resources in Lake Chiuta. Suggested sanctions which are at present being implemented were formulated during the time the *nkacha* fishers were being evicted from Lake Chiuta and after subsequent formation of the BVCs.

Table 7: Formal regulations and sanctions

Formal regulation	Sanctions	Informal regulation/Agreements	Sanctions
Licensing of fishing gears	<ul style="list-style-type: none"> Confiscation of fishing gears and prosecution 	Fish traps to be woven more than twice between vertical sticks	<ul style="list-style-type: none"> Confiscation of fishing gears Violators are demanded to pay fines (K50) by BVCs/local leaders
Ban on use of <i>nkacha</i> seine nets	<ul style="list-style-type: none"> Confiscation of fishing gears and prosecution by FD Fishing gear may be burnt by BVCs <i>nkacha</i> fishers are chased away 	Ban on exploitation of juvenile <i>Oreochromis</i> spp.	<ul style="list-style-type: none"> Fines in form of cash is demanded by BVCs/local leaders
Use of a minimum of 2¾" mesh sizes on gill nets	<ul style="list-style-type: none"> Confiscation of fishing gears and prosecution 	Ban on constructing temporary dwelling structures in the water	<ul style="list-style-type: none"> Violators charged a certain sum of money by BVCs
		Ban on <i>chiombela</i> (practice of beating water to drive fish towards set gill nets or other fishing gears) fishing method	<ul style="list-style-type: none"> Fines in form of cash is demanded by BVCs/local leaders
		Inspection of fishing gears (belonging to migrants) before operation in Lake Chiuta	<ul style="list-style-type: none"> In case of no compliance, the migrant may be chased back before operating on the beach

From the Table above, it is shown that informal regulations are more than the formal regulations. The ban on the use of *nkacha* seine net is the only formal regulation with highest legitimacy as it is considered a core element of the Lake Chiuta co-management arrangement. The other formal regulations that were gazetted in 1997, were formulated by FD in consultation with the fishing community. Most of the informal regulations were formulated after the BVCs were set up which was an idea from FD. It may be considered that the regulations were just adopted from other water bodies especially Lakes Chilwa and Malombe and central Lake Malawi Whilst they may be legitimised they are not easily enforced as their impact on the fish stock levels and landings may not have been appreciated by the local fishers. This is an area where further research may be pursued.

7.2 Resources required for the implementation of planned activities

Fisheries Department

The Malawi Government provides funds to support extension and licensing activities. The funds are in form of salaries and wages, transport, fuel and lubricants, housing and staff. Sometimes training sessions and meetings are funded by the Government through project support.

BVCs, association and local leaders

This partner group mostly uses canoes when chasing *nkacha* fishers. They sometimes use their bicycles or walk to various beaches disseminate very important information especially when cases of *nkacha* operations have been reported. Some have radios from which they listen to Usodzi wa Lero Programme for fisheries related messages. Some BVCs which have funds stated that they utilise their funds to meet costs of their meetings. However, some members of BVCs indicated that uniforms important just to be identified that they are members. The association reported that it has plans to build an office in which all accounting and other documents will be kept. They also expressed a need for patrol boats from the Government so that they can easily apprehend *nkacha* fishers operating in other parts of the lake.

7.2 Conflict resolution

A number of cases were reported as major problems experienced in the co-management set-up. The most common cases found in this study are as follows:

(a) Thefts cases among fishers

From the past cases of fishing gear theft have been encountered by the fishing community around Lake Chiuta. In some cases fish may be stolen from the temporary dwelling huts as was reported by Aduwa fishers.

(b) Power struggle between local leaders and BVCs

It was reported by some fishers at Misala and Mthubula that some local leaders do not consult the BVCs whenever they are reporting some issues to the Traditional Authority. Sometimes these local leaders used to allow *nkacha* fishers to operate in exchange of some benefits from the fishers. During the time the *nkacha* fishers were chased in 1995, the BVCs (then pressure groups) made their stand very clear in presence of Traditional Authority Kawinga, Sub-Traditional Authority Ngokwe, all local leaders (village heads and group village heads), fisheries officers and District Commissioner from Machinga that the authority to deal with all fisheries resources should be given to them whileas anything to do with land be left to the local leaders. It is this stand which is viewed negatively by some local leaders, as in a way it appears to erode their respect.

Potential means of resolving the issue is through civic education so that the roles of both stakeholders are clearly understood by each partner. With decentralisation policy and the new Fisheries Act, both partners are key players in resource management and this should be understood by both sides.

(c) Social conflicts

These are sometimes reported whenever migrant seine net fishers were going about with school-going aged girls within the community. Educational prospects for the young girls were affected through unplanned marriages. As a way of addressing the problem, the seine net fishers have been chased away from Lake Chiuta. If these are cases from within the fishing community, they are handled in a traditional manner by involving local leaders.

(d) Economic conflicts

Catches from seine net fishers were larger which was resulting in highly competitive with smaller catches from the indigenous fishers using gill nets, fish traps and long lines. It was this competitiveness in pricing that was another source of conflict between the indigenous fishers and the seine net fishers. To resolve this issue, the local fishers have been chasing and enforcing seining ban on Lake Chiuta.

(e) Double fee charges from fish traders

The Traditional Authority Ngokwe reported an on-going conflict between local council market fee collectors and the fish traders. Once fish is landed on beaches, the trader is demanded to pay a fee while when he/she takes the fish to another market fees are also demanded. To address the problem the Chief reported that the issue is being discussed with the relevant authorities and may be referred to a district development committee forum.

8. Performance assessment of Lake Chiuta Fisheries Co-Management

Efficiency

In order to assess efficiency of Lake Chiuta co-management set-up, a number of attributes such as time spent in co-management activities, decisions made and time taken to make such decisions, government resources for co-management, reported assessment of resource conditions, information flow and compliance were used. The problem was that the study design had limitations in assessing the attributes in a quantitative manner.

The following Table 6 however, summarises findings of the study in assessing efficiency as an outcome of Lake Chiuta co-management programme.

Table 8: Assessment on efficiency of Lake Chiuta fisheries co-management

Attribute	Indicator
Time spent by stakeholders in management activities	<ul style="list-style-type: none">• Conducting meetings for 2-3 times a month by BVCs• Traditional Authority holds meetings irregularly (may be once a year)• FD conducts meetings through beach visits (4 times per month)• 16 days are spent by FD in collecting statistics in each of the 2 minor strata

	<ul style="list-style-type: none"> Fishers are not regularly contacted except in crucial times (when evicting <i>nkacha</i> fishers)
Improved relationship between government and stakeholders	<ul style="list-style-type: none"> Co-management has resulted in consultative processes in decision making Co-management process has improved the fisheries extension service as before the programme, it was mainly catch data collection that was considered a major activity by FD
Improved compliance	<ul style="list-style-type: none"> Majority of the fishers comply to informal regulations and some formal regulations Licensing of fishing gears is not largely complied to as it was wrongly introduced in the fishery
Magnitude of conflicts	<ul style="list-style-type: none"> Conflicts have reduced since <i>nkacha</i> fishers were evicted Illegal fishing has been reduced as there appears to be fear of the BVCs who are viewed as enforcers and they are also afraid of fines or sanctions
Cost saving for government and government resources for co-management	<ul style="list-style-type: none"> Since the co-management arrangement was started by BVCs there is very little that the government has been spending in the programme FD is only spending on salaries of extension staff, funding some meetings/training sessions, allowances and fuel for extension programme
Assessment of resource conditions	<ul style="list-style-type: none"> Qualitatively reports from fishers indicate that the resource has improved
Substantive decisions made and time taken to make decisions	<ul style="list-style-type: none"> Quick action is taken issues that threaten survival of indigenous fishers such as <i>nkacha</i> operations Licensing is still a controversial issue which has taken more than 2 years

From the above outcomes, considering that banning of *nkacha* fishing operations in Lake Chiuta was a central element in the co-management process, it is generally concluded that efficiency has fairly been achieved. The design of the programme was not expensive as an initial process of community mobilisation in forming pressure groups had already begun. The co-management arrangement was associated with many costs when the FD joined as a partner otherwise the whole process was first started by the communities themselves.

Equity

Equity was assessed by focusing on representation, process clarity, homogeneous expectations and distributive effects. With respect to representation, the study found that there is representation between the BVCs and the FD while in some cases this representation of interests by fishers in the BVCs was lacking. At Nafisi beach a group of fishers stated that they were not visited by the BVC of that area. However they expressed interest to have active BVCs to work hand in hand with the extension officers.

It was reported that communities especially the BVCs were consulted on issues put forward by the FD. However, it was observed that in some cases process clarity was not stated to be lacking by some fishers. In some areas it was not known why BVCs were formed and what their roles were in resource management.

The expectations between the FD and communities were the same when considering resource management issues like habitat protection, effects of undermeshed fishing gears, regulatory measures and legislative framework to achieve sustainable supply of fish. However, in some respects like raising standard of living for the rural communities and promotion of community participation concept remain the Government's main interests while the BVCs focus on social recognition and enforcement as community's major interests.

The distributive effects of the fisheries resources and income among the resource users were not conducted during the re-visit study as this work could demand a comprehensive research design. This is a limitation of this study. However, considering that fishers owning *nkacha* seines are banned, it is expected that resource exploitation is for the fishers owning cheaper fishing gears such as gill nets, fish traps and long lines. In this case access to the resource is open to mostly the passive fishing gears only.

Table 9: Equity attributes

Attribute	Indicator
Membership, changes and decision-maker	<ul style="list-style-type: none"> • Membership in BVCs varies between 10 and 12 • Local leaders are advisors • No change since the co-management started in 1995. Changes are made when replacing a member who is either dead or is away • Decision making is confined to majority within BVCs and confined to such institutions only with limited consultation among fishers
Clarification of stakeholders – knowing fishers within and awareness of decision making	<ul style="list-style-type: none"> • Limited clarification of stakeholders such as BVCs, association, local leaders and FD by community
Level of expectations of individuals regarding objectives of fisheries management	<ul style="list-style-type: none"> • The individual members of BVCs are generally aware about objectives of co-management • Level of expectations among the majority of the fishers is heterogeneous, as interaction between BVCs and fishers is limited • Level of expectations among individual FD staff varies
Impact of changes in the distribution or allocation mechanisms on income of fishers	<ul style="list-style-type: none"> • After eviction of <i>nkacha</i> fishers the gap in the levels of income among the indigenous fishers is not very wide
Objectives of management between government and stakeholders – whether they are the same or not	<ul style="list-style-type: none"> • Objectives of management between FD and stakeholders vary as the initial idea of approaching the FD was to get support to chase away <i>nkacha</i> fishers due to social

	<p>conflicts which arose (unsafe drinking water, competitiveness in prices offered for sale, early marriage proposals to girls, etc.)</p> <ul style="list-style-type: none"> • BVC formation idea was from FD • Idea of loan provision was from FD • Proposal to recognise local leaders in the co-management set-up was from FD • Licensing issue is from FD • Informal regulations are not supported by any biological/ecological research studies
Representation	<ul style="list-style-type: none"> • In broad context the fishers' interests are represented in the co-management process when it is considered that most of the BVCs members are also fishers or are owning fishing gears • Representation of interests in terms of other fishers who are not BVC members is limited in some areas like Nafisi
Transparency and process clarity	<ul style="list-style-type: none"> • Within community there is transparency and process is clear • Between BVCs and fishers – the process is somehow not clear and transparent • Between FD and BVCs – in terms of formulation of regulations the process was not clear as FD came in with new ideas and promises within a short period of time but there was transparency as all new ideas were openly discussed in presence of all BVCs.
Increased consultation among stakeholders	<ul style="list-style-type: none"> • Limited consultations between BVCs and fishers
Sharing of rights between state and community – improved or worsened equity for stakeholders	

From the Table 8 above it is concluded that equity is lacking between BVCs and fishers. In most cases fishers are not consulted about any management issues in which case the BVCs do not represent interest of the fishers. However, it is fairly accepted that equity exists between FD and BVCs.

Table 10: Sustainability indicators

Attribute	Indicator
Change in attitudes to fisheries management – short term and long term	<ul style="list-style-type: none"> • There is change to fisheries management in terms of both FD and stakeholders (BVCs/fisheries/association)
Improved compliance	<ul style="list-style-type: none"> • Majority of the fishers comply to informal regulations and some formal regulations • Licensing of fishing gears is not largely complied to as it was wrongly introduced in the fishery
Improved conflict resolution– has there been major disputes between committees/interest groups?	<ul style="list-style-type: none"> • There have been conflicts between resource user groups such as seine net fishers and gill net fishers

	<ul style="list-style-type: none"> • There is an effective mechanism of resolving conflicts
Are the committees or management groups able to sustain by themselves (a) extent of reliance on external inputs (b) commitment of government	<ul style="list-style-type: none"> • Some BVCs have started contributing to their BVC financial schemes • Fishers depend on FD for loan packages • FD committed to the co-management arrangement as a way of advocating decentralisation and local participation concept
Factors that may improve management	<ul style="list-style-type: none"> • Effective extension programme - not based on promises but what will deliver and enable all stakeholders understand their various key roles in the co-management arrangement • Resource monitoring and data analysis with feed back to the resource users • Economic empowerment among BVCs • Elect members in a democratic process not by imposition and make changes after an agreed duration e.g after 2 years to give chance to others • Capacity building for both FD and resource user groups
Flow of benefits/costs on an individual basis - benefits > costs over time, are benefits arising out of donor activities or out of internal management of the resource	<ul style="list-style-type: none"> • Benefits in terms of good catches are not largely due to donor funding • Costs are less than benefits (qualitative assessment)
How the community arrangement cope up with major exogenous impacts such as floods, drought, civil war	<ul style="list-style-type: none"> • Not yet. However, the influx of <i>nkacha</i> fishers may be viewed as an external factor which has been carefully adressed
Resilience	<ul style="list-style-type: none"> • There is more resilience as regulations have been reviewed and formal regulations gazetted • There is less dependence on external support and hence sustainability is assured

9. Major problems presented by the stakeholders

The FD, BVCs, association and local leaders cited a number of problems encountered in the co-management arrangement.

(a) Problems associated with the shared ecosystem

Of particular interest and common to all stakeholders was the problem of managing Lake Chiuta fishery considering that it is a shared ecosystem. The problem of *nkacha* operations noted by the Malawian fishing community appears not to be appreciated by the local leaders and fishers in the Mozambican waters. This is one of the greatest challenges that lies ahead of any future management strategies of the lake. There have been several meetings organised to discuss and agree to certain terms with the Mozambican local authorities but the situation does not improve as use of *nkacha* fishing gears is still being observed. It is therefore recommended that the discussions taking place at the local level be brought to the attention of

higher authorities in both Governmental relevant institutions. A joint commission on the management of the small lake may be of benefit in future to surrounding populations in terms of nutrition, income earnings and employment due to sustained supply of cheaper dietary protein source.

Resource monitoring initiatives in terms of catch data collection and analysis has some limitations as the lake is divided into two minor strata in the Malawi's territory only. This underscores any potential the lake might have in form of future fisheries development plans. For example, catch statistics and frame survey data are recorded in the Malawi's territorial zone, which accounts for approximate 60% of the ecosystem. This could lead to some problems as in one side the effort may be increasing while the opposite is happening on one side. The co-management arrangement may also mean the fishers on the Malawian waters be considered custodians of Lake Chiuta resources and manage them while the Mozambican fishers just enjoys the fruits of the co-management programme. It is important that any research work on the lake should focus at the entire ecosystem through proper joint arrangements between the two countries.

(b) Access to fishing gears and suitable craft

The fishers stated that despite the fact that most of the loanees in the first scheme performed poorly in repaying back the loan which they got from MAGFAD Project, they were of the opinion that it was important that they get some gillnet bundles on loan. Those who have been failing to pay back the loan attributed hunger as a major factor that contributed to the poor loan recovery.

Records on fishing gear indicate a reduction in the use of gillnets over the past decade. There is more investment in fish traps as opposed to the situation it was around early 1990s. There are very concrete reasons behind the failure to reinvest in gillnet fishery despite good catches the fishers claim to realise. It is difficult to understand that the same fishers could invest in gillnet fishery some few years ago by using their own cash yet now they are want loans. This is an area some research should be done so that it is easier to know why reinvestment in gillnet fishery appears difficult. However, without any further supportive explanation it could be that the reasons are more of labour migration and general economic situation in terms of inflationary pattern.

The scarcity of suitable trees to construct dug-out canoes due to the continued deforestation has in general resulted in declining numbers of canoes on Lake Chiuta. However, considering that Mozambique has had plenty of natural resources including natural forests the point of scarcity of trees around Chiuta area may be questionable. The recent ended civil war made it difficult for people to exploit such resources and secondly the widely disseminated extension message on the use of planked canoes appear to be the main reasons why the fishers are looking for loans to procure the planked canoes with bigger capacity and are easily paddled in such shallower conditions as those of Lake Chilwa. Those interested to be planked canoe builders should be assisted by the FD to gain suitable skills. The boat building industry itself could be an option for alternative form of generating income.

(c) Business management and literacy skills

Limited skills in business management have been manifested in searching for loans to procure fishing equipment. Fishing business is characterised by its seasonality and hence demands financial prudence in utilising benefits while considering short- or long-terms. Viable investment measures and savings made in a fishing business could yield long term benefits. In this way a fisher may not demand more loan packages and it has been experienced that loan issues have created relationship instability between the FD and the fisherfolk.

It is therefore important that the FD should equip the fisher in money saving measures by encouraging opening up of Post Office Savings Account and be trained in business management. Although the level literacy in the area is not quantifiable, it is a fact that the national statistics show that illiteracy level is over 60%. Some initiatives to improve the literacy level of the fishing community should be designed as part of the co-management programme. This will also try to improve the understanding of the concept of co-management and its aspired goals from both partners (Government and fishing community).

(c) Lack of enabling environment

Whilst powers are with BVCs in terms of resource management in Lake Chiuta, they are not legally empowered. Payment of money as fines to either the BVCs or local leaders could be a threat to the co-management process. The local leaders according to laws of Malawi are not supposed to collect money as part of fines. It is only a court of law which has been mandated through legislature to do so. Local leaders should charge payment in form of chickens or goats. What makes compliance high at present in lake Chiuta is because of the sanctions that are imposed to offenders. Once the severity of these sanctions become reduced, the *nkacha* fishers will come back. Therefore there is need to review all sections in the Fisheries Conservation and Management Act and Legislation so that all these potential threats are considered.

In the co-management arrangement the role of local leaders is just reduced to conflict resolution. The benefits and respect they used to gain from the evicted *nkacha* fishers are no longer available as much as it was before the co-management programme. This is another source of conflict as all beach activities are performed by the BVCs and not the local leaders. It is therefore important that the Act stipulate clearly what roles each stakeholder should play to avoid any further misunderstandings among themselves.

The section in the new Fisheries Conservation and Management Act appear to have some flaws which need to be addressed immediately or any left out important issues be refereed to the legislation document. One most important issue is on the form of agreement to be signed between the Director of Fisheries and local fishers. This may appear to be a contractual arrangement which one partner may decide to pull out without any problem. If resource management is to be considered in this way, all democratic principles and empowerment of

the local fishers would be short lived and difficult to experience. In the end sustainable, efficient and equitable resource management will not be achieved.

(d) Thefts

It was reported that fishing gear theft cases are common. Offenders are evicted from the beach they have been based. Civic education may in long term assist to reduce the problem. It may be difficult to eradicate the problem as it is associated with behaviour and attitude of individual fisher.

(e) Threats by crocodiles

The fishers at Misala and Mthubula beaches reported that crocodiles have been posing a threat to the fishing industry. In some cases fish caught in gill nets is eaten by the crocodiles thereby reducing landings and subsequent income. As similar case used to be experienced in Lake Malombe around 1960s and 1970s the fishers reduced the problems of crocodiles in fishing by activating the operations of gill nets. In its 1962 Annual Report, the Ministry of Natural Resources and Surveys indicated that there were some interesting developments in Lake Malombe where, in the face of repeated attacks of crocodiles, gill nets used in the normal way had almost been abandoned. Instead some 900 m were set in a circle about the fishing craft which they moved repeatedly round the inner circumference with the crew beating the water to drive the encircled fish into the nets. This reduced damage from crocodiles and had the fish landed in a much fresher condition than those from the ordinary night-set gill nets. This is another area on which a research programme can be designed.

11. Conclusion and recommendations

The Lake Chiuta re-visit study has shown that assessment of the co-management arrangement is based on the type of management tasks and the stage of implementation. During the initial stage when the fishing community made a decision to chase away *nkacha* fishers and setting up a legal framework to govern exploitation of Lake Chiuta fisheries resources, the co-management arrangement could be described as of *advisory* type. However, when the community approached the FD for guidance and adoption of certain ideas such as formation of BVCs, association and loan issues, the co-management arrangement shifted to *co-operative* and *consultative* type. This varying assessment agrees with what was reported by Sen and Nielsen (1996) when it was stated that different management tasks would be subject to different decision-making arrangements, and it could possible that in a particular fishery, the whole spectrum of different co-management arrangements could be present.

It is clear from this study that Lake Chiuta co-management programme was introduced to address a conflict between resource users who were indigenous group operating traditional and cheaper fishing gears and dug out canoes against the migrant *nkacha* fishers operating a more expensive active open water seine net and planked boats. Jentoft and McCay (1995) made a similar observation that fixed gear fishers are often in strong opposition to those using mobile gear. Of particular interest is the fact that the resource users identified the damaging effects of *nkacha* and then approached the FD for advice. It is therefore expected that since the problem was noted by the fishing community, the co-management programme may

achieve sustainability as it the community which enforces and monitor fishing operations more than the Government.

However, the inadequate representation of the resource users' interests and the limited clarity on issues regarding fish resource management can threaten sustainability of the programme. It is important that majority of the fishers be aware of the objectives of the co-management arrangement so that they can participate in the decision-making process. The objectives and goal of the co-management arrangement should be equally known and elections of BVC members be conducted after an agreed duration according to their constitution.

Limited clarity process on roles of each stakeholder especially between BVCs and local leaders may be a source of conflict which if not addressed will affect performance of the programme.

The FD's intervention with new concepts led to some misunderstandings of the role of the Government. The FD was brought into the system to provide advice as to how an enabling environment could be created so that resource management in Lake Chiuta is legally recognised. It was, however, too urgent to promise the communities a number of schemes such as licensing and loan packages. Whilst it was important to introduce a licensing system in the lake as a way of revenue collection and entry regulation, it was necessary that some research could be done to find out how many gears types qualify for licensing. For example there are very few gillnets at present as opposed to early 1990s. This means that as a new system civic education could be done to facilitate participation of the BVCs in collecting license fees rather than sending a fisheries licensing team to do that as a way of reducing operating costs.

The FD staff are not skilled in loan disbursement and recovery. Even if they are trained in business management, fisheries extension staff should not be made loan officers otherwise their roles in working with the fishing community would not be clear. It is recommended that loan issues should be handled by lending agencies equipped with skills in disbursement and recovery process. The fisheries extension staff should be trained in business management so that the fishers can develop some money saving mechanisms to cushion their financial status during rainy season when fish trading activity becomes slacken.

Empowerment of the resource users should be considered with caution. It is necessary to identify sanctions that would be legally acceptable. There is also a need to identify who will impose such sanctions. The legal documents of other sectors should be scrutinised and any harmonisation be done. For example, BVCs and local leaders ask for fines in form of cash from offenders while the laws of Malawi do not accept such practices. On the other hand leaving the system free of any sanctions would jeopardise the co-management arrangement. The *nkacha* fishers may be back operating in the lake as they may opt to appear before a court and pay a fine and secondly they are aware of shortfalls the FD enforcement unit has in terms of patrolling the area and limitations in handling prosecution cases. This is an area which should be dealt with thoroughly and cautiously. The revised Fisheries Act should also be carefully scrutinised as on the *Local Community Participation Section*, it is recommending forms of agreements between local management authorities and the Director of Fisheries. This is a form of a contractual arrangement which may not be suitable to other small-scale

fisheries management systems like Lake Chiuta co-management programme which seeks continuity and not any failure in terms of managing contracts.

Although Lake Chiuta co-management programme was initiated by the resource users, it is important that capacity building is enhanced especially as BVCs are in place. The BVCs and fishers should be clear on the property rights governing Lake Chiuta resources. Where communal property rights are considered then the interest of the Government should also be made clear so that convergence of interests from both partners is assured. The FD staff should also be trained so that they are able to analyse situations before making any recommendations that may threaten survival of the co-management arrangement.

As a shared ecosystem, Malawi and Mozambique should set up a joint commission to take into account interests of both countries. Where participatory approaches are advocated in one country this should also be adopted on another country. Resource monitoring and extension programme should be jointly implemented for benefit of communities along the lake.

While the co-management arrangement for Lake Chiuta is inadequate in representation, clarity process and fairly equitable in terms of information flow, it can be considered a remarkable model as a case where communities were the first to identify a crisis and proposed regulatory measures in a legal context. Sustainability of the programme will actually be associated with the fact that the co-management programme was initiated to chase away *nkacha* fishers and the FD was identified as an appropriate partner to advise the fishers on what course of action to take.

Being in the implementation phase, evaluation of efficiency, equity and sustainability may be difficult. However some subjective indicators may be identified to determine the status of the co-management arrangement. The Lake Chiuta co-management programme may be generally considered efficient when time and financial resources may be taken as indicators. After the pressure groups were formed in February 1995, the whole operation took only four months to drive away *nkacha* fishers and two years later some revisions were made to include fisheries regulations for Lake Chiuta.

In terms of resources, the FD has been spending funds to meet salaries and wages of staff, fuel and transport. Costs on some meetings, training sessions and loan recovery campaigns have also been met by the FD. Considering that the expenditure has been within more or less the same limit where Government funding is concerned, it could be concluded that the co-management programme is relatively efficient.

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