

The Challenges and Potential of the Fisheries Co-Management Programmes in Malawi: Case of Lake Malombe Participatory Fisheries Management Programme

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Abstract. Fish resource management system in Malawi has undergone several changes for nearly a century. The conventional centralised fisheries management system was introduced after the colonial rule through a mandated Fisheries Department, taking over the whole responsibility of controlling exploitation of fisheries resources from the traditional powers. The major focus at that time was on fisheries development whereby technologies on fishing methods, fishing gears and craft were being introduced to exploit the fisheries resources. However, by late 1980s, fish catches of commercial *Oreochromis* spp. in Lake Malombe began to decline. This was due to a number of factors such as the uncontrolled increase in fishing effort, environmental degradation and limited capacity of the Fisheries Department to enforce regulations. Consequently, the declining catch levels of *Oreochromis* spp. in Lake Malombe necessitated a refocus of the fisheries management system in order to facilitate recovery of the collapsed fishery. A pilot participatory fisheries management programme was therefore introduced in 1993. This is a co-management arrangement whereby local level representative institutions called Beach Village Committees (BVCs) and the Department of Fisheries (DoF) are considered key partners and jointly make decisions. This paper, therefore, highlights the challenges and potential of fisheries co-management programmes in Malawi and proposes a way forward for improvement.

Keywords: Co-management; Malawi; Fisheries; Participatory; Traditional System, Centralised System

1. INTRODUCTION

Fish resource management in Malawi has mainly been based on the centralized approach for nearly a century, after the colonial rule. During the pre-colonial era, local traditional leaders were responsible for granting access to the natural resources such as land, forestry, wildlife and fisheries. Chirwa (1997) stated that the traditional management control largely died out with the commercialization of the fishing industry during the first two decades of the last century. It was also indicated that the traditional control was over the general social and economic activities of the people who were under a particular chief. According to Chief Chimwala, the power of the chief was over his people. He was their guardian, and they gave him gifts of food and other items in return for his guardianship. A portion of fish was always given to him as a token of appreciation.

However, in isolated cases, traditional fisheries management has been practiced by certain communities whereby local leaders have powers

to control fisheries exploitation. A typical example is Mbenji traditional fisheries management on Mbenji Island, Lake Malawi where Chief Msosa with his committee perform cultural rites by giving sacrifices to ancestral spirits and then close the Mbenji fishery from December to March/April every year. This started around 1950s and is still being practiced without any intervention from the Department of Fisheries (DoF).

The conventional centralized system has been characterized by formulation and implementation of fisheries regulations governing exploitation of fisheries resources in major water bodies of Malawi including Lakes Malawi, Malombe, Chilwa and Chiuta and Shire River by the DoF. The fisheries regulations were based on biological findings and then imposed on the resource users in a top-down approach. This resulted in rampant violation of the regulations due to lack of legitimacy resulting in decline in catches of the valuable *chambo* (*Oreochromis* spp.) in the southern tip of Lake Malawi, Lake Malombe and Upper Shire River. This represented a substantial loss to the economic value of the small-scale fishery.

The decline in fish landings necessitated a need for new interventions in the resource management. A management plan focusing on community participation in designing, planning and implementation, termed as the Participatory Fisheries Management Programme (PFMP) for Lake Malombe, on a pilot basis, was therefore drawn up in 1993. Two field socio-economic surveys were conducted in 1992 to assess the impact of declined catches on the livelihoods of the Lake Malombe fishing community.

2. THE CONCEPT OF 'CO-MANAGEMENT'

Fisheries managers pursue multiple goals. Rarely is the task of fisheries management defined in biological terms only. There are also social and economic concerns. The reason is obvious: capture fisheries management - as opposed to aquaculture - is aimed at people, not fish. What is 'rational' at societal level may be intolerable at local level. What is efficient from an economic perspective may be socially and culturally harmful. Also, what makes sense in biological terms may be unwise in social and economic terms. All things considered, a maximum sustainable yield is not necessarily the optimal yield (Jentoft and McCay, 1995). This results in conflicts among various user groups and policy objectives governing utilisation of fisheries resources in Malawi with particular reference to the artisanal sector.

Co-management as defined by Sen and Nielsen (1996), is an arrangement where responsibility for resource management is shared between the government and user groups. It is considered to be one solution to the growing problems of resource over-exploitation as the concept focuses on the recognition that user groups have to become more actively involved in fisheries management if the regime is to be both effective and legitimate. This concept has recently emerged on the premise that the effectiveness of the centralised fisheries management system in maintaining or achieving sustainable utilisation is persistently debated and questioned as some fish stocks in certain localised fishing grounds continue to be either fully exploited or in crisis as was the case with Lake Malombe and Upper Shire River around early 1990s.

Participation, as defined by Campbell and Townsley (1996), is the active, meaningful and influential involvement of individuals or groups in an activity. In the context of fisheries co-management, it means that individual fishers or fisher groups and other agencies through various forms of structures are actively involved in the management of fisheries resources. If management is to succeed (Wilson et al, 1994), fishers must support

management efforts; and that support will be realised if they have evidence that regulations are working in their best interest. Individuals who are required to engage in short-term sacrifice in order to obtain collective (or private) long-term benefits need to be assured that their sacrifice really will have a positive impact on the health of the resource otherwise there can be no perceived long-term benefit.

However, as observed by Jentoft and McCay (1995), the degree of user group involvement may differ from one country to another. Correspondingly, the organisational set-ups may also vary. The two extremes are: (1) government power, and (2) fishers' power. In the first instance, fishers are at the receiver's end as fisheries management is entirely a top-down process. At the other extreme, fishers have full control. They organise and run their own management system, either through institutions that are basically informal or by means of a formal organisation, like a committee or co-operative.

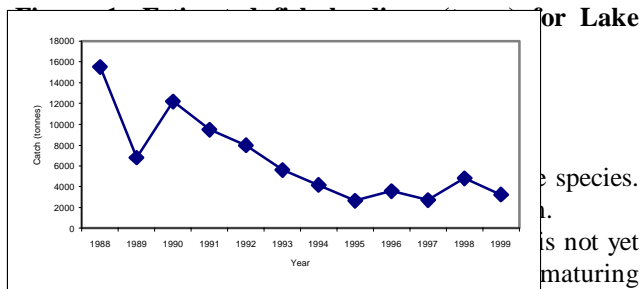
3. LAKE MALOMBE ARTISANAL FISHERY

Fishing is the major socio-economic occupation for the communities around Lake Malombe and Upper Shire River. Chirwa (1997) reported that fishing and fish trading activities support some 400 gear owners, 2,700 fishers, 2,300 crew, approximately 1,220 traders and unspecified number of fish processors. The frame survey conducted in 1999 indicated that 410 gear owners, 1,651 ancillary workers operated on Lake Malombe (Weyl *et al.*, 1999). The population of the area in 1996 was estimated at about 69,000 fishing families residing in at least 45 villages (33 of them along Lake Malombe and 12 along the Upper Shire River). The villages have no fewer than 82 fishing beaches about 65 on Lake Malombe and 17 on the Upper Shire River.

Lake Malombe and the Upper Shire River lie between latitude 14°21' to 14°45' south and longitudes 35°10' to 35°20' East. They are part of the Great Rift Valley system. Lake Malombe is shallow, with an average depth of 4m, about 30 km in length and has a maximum width of 15 km. The Upper Shire River, about 13 km long, flows from the southern tip of Lake Malawi before widening to form Lake Malombe. The lake has a surface area of approximately 390 km² and is fed by water from Lake Malawi through the Upper Shire River and is further enriched by inflowing streams from highly populated catchment areas and by recycling of nutrients in sediments as a result of the shallowness of the lake. Lake Malombe is therefore, much more productive than Lake Malawi. In 1988, when the fishery was near its peak, the lake produced about 15,000 tonnes of fish,

approximately 17% of Malawi's total production. However, the fishery has shown rapidly declining total annual catches (from about 15,000 tonnes in 1982 to nearly 2,000 in 1994), representing a considerable loss in income levels of the fishers. The total catch value, as reported by Wilson (1993), had fallen from about MK36 million in 1982 to about MK8.4 million in 1990.

The main species targeted include *Oreochromis* spp. locally known as *chambo* and *Haplochromine* spp. called *kambuzi*.



at about 5 to 6 cm

and have low fecundity. Recruitment is strongly related to the size of the adult stock, thus being capable to high fishing pressure (Tweddle *et al*, 1994). Other species appearing in commercial catches are mainly catfish like *Clarias gariepinus*, *Bagrus meridionalis* (locally called *kampango*) and certain cyprinids like *Engraulicypris sardella* (locally known as *usipa*).

The most common gears used include *nkacha* (open water) seines, *kambuzi* seines and gill nets. The number of *chambo* seines have been reducing from 11 in 1988 to almost nothing in 1997 indicating that either *chambo* stocks are still dwindling or that there is a shift in investment from more expensive *chambo* seines to cheaper gill nets which have steadily been increasing from 1988 to 1997. The *kambuzi* seines which were 101 in 1989 have been reducing to around 30 in late 1990s while *nkacha* seines have been more than 200 since 1991 as shown in Table 1. The implication is that without complying with changing of mesh size from fine meshed *nkacha* to about 19 mm or 25 mm mesh sized seines, the habitat and catching of juvenile fish will continue threatening recovery of the declined *chambo* stocks. The number of operators has, however, been between 2,000 and 3,200 from 1988 to 1997.

Table 1: Fishers and gears for Lake Malombe

Year	Fishers Nets	Gill Seine	Chambo Seine	Kambuzi Seine	Nkacha
1988	2454	474	11	77	157
1989	2768	453	15	101	144
1990	2077	440	6	56	186

1991	2731	402	6	84	255
1992	3069	583	6	75	227
1993	2206	358	3	49	227
1994	2698	201	3	50	247
1995	3267	510	4	52	263
1996	2231	280	1	29	205
1997	3274	681	0	34	214

The problems associated with the management of artisanal fisheries in Malawi were first outlined by the UNDP funded Chambo Research Project Report (1994). The project was implemented in the South East Arm of Lake Malawi, Upper Shire River and Lake Malombe from 1988 to 1992. The report indicated that *Oreochromis* spp. in Lake Malombe had collapsed due to indiscriminate capture of juveniles by fine-mashed seine nets. For the same reason, *Haplochromide* spp. was then in danger of becoming overfished. The overall value of the Lake Malombe fisheries had declined substantially, and with them, fisherfolk incomes. In the Upper Shire River and South-East Arm of Lake Malawi all commercially important stocks were fully exploited. This meant no further increases in fishing could be sustained, and hence a management strategy was needed as a matter of urgency.

The serious decline in catches prompted a search for other alternative fisheries management strategies. A management plan focusing on community participation or co-management, termed as the Participatory Fisheries Management Programme (PFMP) for Lake Malombe and Upper Shire, as a pilot project, was drawn up in 1991 with support from the ODA. Two socio-economic surveys were conducted by Bell and Donda (1992) with funding from the Fisheries Department and GTZ. The Fisheries Department and the local community had been implementing the management plan with financial and technical support from the Malawi Government, GTZ, UNDP, ODA and World Bank-Fisheries Development Project from 1993 to 1997. Since then the donors have phased out their support leaving out GTZ and Malawi Government as principal funding agencies for the programme. The termination of support from the other donors has led to streamlining of the activities to focus on the major areas of the PFMP although there have been some repercussions on certain components which heavily depended on funding from respective donors.

The other important factors that attributed to the initiation of the Lake Malombe PFMP included limited capacity of the DoF in implementing centralized fisheries management system, especially in enforcing regulations. Another reason is due to a change in thinking in natural resource management as co-management arrangements have increasingly been advocated whereby community participation is considered a central element of gaining

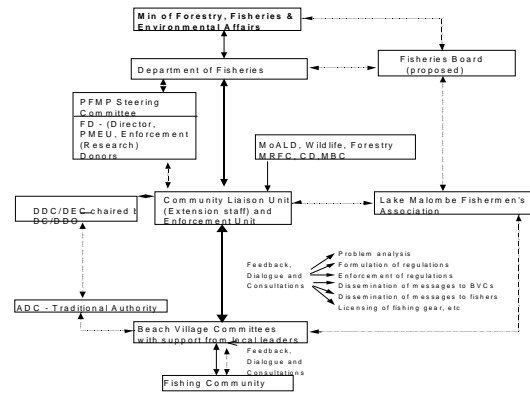
sustainability. Lastly, the PFMP was recommended through donor influence (Donda *et al*, 1999).

A number of management measures were introduced by the DoF to regulate entry into the Lake Malombe fishery, protect breeding and juvenile fish by observing closed seasons and legal mesh sizes. It proved very difficult to enforce such regulations because resources had been inadequate for the activity. The co-management approach involving the DoF and fishing community representatives called Beach Village Committees (BVCs). The Participatory Fisheries Management Programme (PFMP) was therefore introduced as a way of increasing legitimacy of the fisheries regulations and hence resulting in improved compliance.

3.1 The Lake Malombe PFMP implementation arrangement

The Lake Malombe PFMP set-up has been elaborated by Donda (1995), Hara (1996), Chirwa (1997), and Njaya (1998). Basically, the programme recognizes two key partners; the DoF (local based fisheries staff in the community liaison unit) and representative local institutions called Beach Village Committees (BVCs) with local leaders as their advisors (Figure 2). There are a total of 31 BVCs around Lake Malombe and Upper Shire River. Apart from the donors, there are several line Ministries or Departments that have been supporting the programme. The Ministry of Agriculture and Livestock Development (MoALD) has been providing technical know-how on tomato production; Department of Wildlife supports bee and guinea fowl production as alternative income generating activities (IGAs) while Forestry Department has been assisting the BVCs and fishers in establishing woodlots for future use in fish processing and boat building.

The Malawi Broadcasting Corporation, a local radio station has been used to disseminate fisheries extension messages such as on environmental management such as control of water hyacinth, fishing methods, closed seasons, licensing and fish processing methods. The Malawi Rural Financing Company (MRFC) is the lending agency that has been providing loans to women's and men's credit groups as start-up capital for small-scale and medium enterprises as part of IGAs.



- : Co-ordination/linkage not fully functional
- : Co-ordination/linkage fully functional
- MoALD : Ministry of Agriculture and Livestock Development - provide technical knowledge to individuals or groups on tomato growing as alternative income generating activities (IGAs)
- MBC : Malawi Broadcasting Corporation
- MRFC : MRFC - a lending agency for IGA groups
- PMEU : Planning, Monitoring and Evaluation Unit
- DC : District Commissioner
- DDO : District Development Officer
- ADC : Area Development Committee
- DoF : Department of Fisheries

Figure 1: The PFMP set-up

Source: GOM/FAO/UNDP (1994) and Njaya (1998)

In the design of the PFMP, extension was considered as a core component, followed by research and income generating activities components. However, with time it was observed that enforcement by BVCs was not, in some cases, effective as it was assumed that the BVCs were to take up such a responsibility over time. At a local level, there are linkages between the Area Executive Committee composed of government department technical officers based in those localised areas and District Executive Committee composed of officers at a higher level within a particular district. They may include Fisheries, Forestry, Community Development, Agriculture and Tourism sectors. These provide technical solutions to problems affecting communities in various parts of the district through Village Development, Area Development and District Development Committees

meetings. These structures were set up to ensure that demand driven projects get support from donors as opposed to financial assistance which has been going to target areas through the central government system. In some cases the interventions, which were proposed by the government, were not what were for the benefit of the community, and without their participation, sustainability of such projects was not in most cases achieved (Njaya, 1998).

3.2 Management tasks

Both DoF and BVCs as co-managing partners have various management tasks in the PFMP. Table 2 indicates the responsibility sharing arrangement in which the DoF appears to do more work than the BVCs.

Table 2: Sharing of management tasks

Management Task	Govt based	Consult	Co-operate	Community-based
Formulation of regulations				
<i>Enforcement</i>				
Closed season				
Mesh sizes				
Juvenile fish				
Prosecution				
Issue transfer letters				
Collection of licence fees				
Issue of licences				
Review of Fisheries Act				
Review of Fisheries Policy				
Enacting new regulations				
Monitoring of stocks				
Catch data collection				
Message delivery				

Source: Donda *et al* (1999)

The above Table indicates that the DoF does most of the management tasks in the PFMP, implying that the programme needs more time if some of the government tasks would be devolved to the communities or of they can shift to the co-operative stage.

3. CHALLENGES ASSOCIATED WITH THE LAKE MALOMBE PFMP

While the PFMP has to some extent demonstrated some merits after almost seven years of implementation, there are equally some challenges that need to be considered for success of the programme. These challenges include the following:

4.1 Efficiency, equity and sustainability of Lake Malombe PFMP

As part of the Fisheries Co-management Project, Lake Malombe PFMP was evaluated in 1999. The evaluation process was based on the resource attributes, patterns of interactions that influence the outcomes such as efficiency, equity and sustainability of the co-management arrangement (Hara *et al*, 1999). Considering that the PFMP had been implemented for only 6 years and due to time and resource constraints, it was difficult in some cases to evaluate efficiency in terms of information costs, co-ordination costs and enforcement costs as outlined by Hanna (1995).

In terms of evaluating equity, Hanna (1995) indicated that four main components of equity should be considered. These include representation, process clarity homogeneous expectations and distributive effects. It was argued that for the management process to be considered equitable, it should adequately represent the range of interests in the fishery. The process should also have a clear purpose and a transparent operation. In the case of Lake Malombe PFMP, Hara *et al* (1999) reported that there was limited representation of interests from the fishers as most the BVC members (nearly 30%) were non-fishers. In certain cases the DoF was not clear in its process of formulating fisheries regulations. This is one of the problems that need to be addressed.

Hanna (1995) indicated that sustainability could be evaluated in terms of stewardship and resilience. Stewardship in terms of the resource users maintaining productivity and ecological characteristics of the resource, and resilience, in terms of the ability of the system to absorb and deal with changes and shock. The evaluation study showed that Lake Malombe was less resilient than the other subsequent co-management programmes such as the Lake Chiuta programme. This was partly due to the fact the Lake Malombe was initiated by DoF while Lake Chiuta programme was initiated by the fishing community (Donda *et al*, 1999). The Lake Malombe PFMP has been depending on external funding and after termination of such funding there are some implications on the sustainability of the programme.

Sustainability in terms of stewardship has in both cases been challenged by the nature of natural resource property rights regime in Malawi. The government assumes the whole responsibility of controlling exploitation of the resources, although there has been a move by government to legally empower the user community to have partial or full control of the resources (Donda *et al*, 1999). The fishing communities have therefore, not yet fully assumed the responsibility which is a challenge that both the DoF and fishing community need to consider for sustainability of the programme.

4.2 Delayed implementation of the Fisheries Conservation and Management Act

The delayed implementation of the Fisheries Conservation and Management Act (1997) implies that DoF is somehow not ready to devolve much of its authority over the fisheries resources to the fishing community. This affects performance of the Lake Malombe PFMP, as some of the issues in the Act focus on resource ownership, community participation and legal empowerment as essential elements in the co-management process.

4.3 Conflicts over authority between the traditional leaders and BVCs

It is a norm and tradition to express appreciation to local leaders who are considered guardians and advisors in within communities. They assume authority in allowing some fishers to operate on beaches which are within their areas. The setting up of the BVCs in the PFMP has created some conflicts as to who between the BVCs and local leaders should have authority to grant access to migrating fishers to operate in their areas. The arrangement is that the BVCs should inspect all incoming gears, licences and get transfer letters from the incoming fishers. This has not been widely accepted by the local chiefs who consider that the PFMP is in a way eroding their traditional powers. There are some incentives with the control of fishing beaches because according to Hara *et al* (1998), every fisher landing on the beach under jurisdiction of the local chief should provide a catch share to the local leader. This is locally called *mawe* or *thini la mfumu*. This just shows some sort of respect to the local leader. However, latest developments indicate that with the advent of democracy in Malawi, these catch shares may sometimes be misinterpreted as a form of corruption, as the local chief in some cases may allow illegal fishers to operate on his beach just for the sake of *mawe*.

4.5 Conflicting legal issues

There are conflicts in terms of understanding traditional and judiciary powers or authorities. During the annual PFMP review workshop conducted in 1996 it was agreed that any illegal fisher should be sanctioned in one way or another. The BVCs agreed that all offenders should appear before the traditional leaders who should demand fines amounting to as high as MK2,000 depending on the nature of the case like fishing during closed seasons. This was to reduce non-compliance of regulation. It was proposed and agreed that the fines should be deposited into the BVC accounts to support their enforcement activities, which were being conducted jointly between the BVCs and DoF. This agreement was put into practice in 1997 and a lot of illegal gears were confiscated and fines were imposed by the local leaders. While it was assumed that the PFMP had taken the right course, the judiciary authorities advised that it was illegal for traditional leaders to impose any fines in form of cash. As traditional leaders, their punishment can only be in form of materials like chicken or goat. As a result of this, non-compliance has been rampant because for any court action, the DoF enforcement unit has to apprehend the offenders and get them prosecuted under court of law. It is the same as like in a centralized system. This is a challenge in the sense that if the traditional leaders are not empowered legally to impose heavy fines as was arranged, the co-management process would not be legitimized within the fishing community.

5. POTENTIAL AND PROSPECTS OF FISHERIES CO-MANAGEMENT IN MALAWI

The PFMP as a pilot co-management programme has so far brought up some insights which would assist in implementation of other co-management programmes. Of particular importance are the following:

5.1 Lessons learned from the PFMP

There are opportunities and encouraging prospects for development and consolidation of fisheries co-management programmes in Malawi. Lessons learned from the Lake Malombe PFMP have assisted to design and implement other co-management arrangements on Lakes Chiuta and Chilwa. As of recent, implementation of some selected areas along Lake Malawi has also started. The local community participation section in the new Fisheries Act was drawn up with some experiences from the Lake Malombe PFMP.

5.2 Group cohesiveness

The fishing community around Lake Malombe is dominated by *Yao* ethnic origin and are in most cases Moslems by faith and most of them are related in one way or another. This could contribute to group cohesion as a potential element in the sustainability of the Lake Malombe PFMP. However, there is need for trust between the DoF and the fishing community.

5.6 Legal framework

Apart from the Fisheries Conservation and Management Act (1997), there are other legislations which would assist in improving performance of the PFMP. The Decentralisation Policy (1997) that Malawi has developed is another potential element in the sustainability of the Lake Malombe PFMP as well as other co-management programmes. The policy devolves administration and political authority to the district level; integrates governmental agencies at district and local levels into one administrative unit, through the process of institutional integration, manpower absorption, composite budgeting and provision of funds for the decentralized services; diverts the center of implementation responsibilities and transfer these to the districts; assigns functions and responsibilities to the various levels and government; and promotes popular participation in the governance and development of districts.

In this context, the local government institutions, which plan and execute projects initiated by local community needs will promote activities of the PFMP in terms of resource provision through licence market fees to be collected by the BVCs/DoF and district assemblies respectively. The funds would be utilized within those districts without getting any influence from the central government. This is where fish resource management at community level will be clearly felt as a need for income and protein supply to the country.

The Environment Management Act was also passed in Parliament in 1996. The Act has provision for establishment of a fund and among others it promotes public awareness and participation of environmental and conservation policies of the government. The creation of the fund is also stipulated in the Fisheries Conservation and Management Act. These funds would be useful for sustainability of various initiatives including fisheries and other environmental management.

5.7 Fish resource condition

It may be too early to analyse condition of the resources as the principal incentive that demands participation of the fishing community. However, since 1996 the declining trend in total catches has been reversed (Figure 1). There is also an improvement in resource recovery. In his catch assessment report from 1994-1999, Weyl (1999) indicated that the small cichlids stocks of Lake Malombe are increasing, this was likely to be the effect of decreased effort in the *nkacha* and *kambuzi* seine fishers. He stated that this showed that management measures such as the implementation of a closed season for active gears have had a marked effect on small cichlid stocks. The change in closed season from December-March to October-December was made in 1997 during a PFMP review workshop in which the fishers were consulted before formulating the regulation. This increase in stocks should however be considered with caution as there may be other important parameters such as water levels that have contributed to the improved resource condition.

6. CONCLUSIONS AND THE WAY FORWARD

This paper has shown that the Lake Malombe PFMP was introduced to address a collapsed fishery. With less than a decade of implementation, there are several problems that need to be addressed for sustainability of the programme. Of particular importance is the need to build up self-sustaining mechanisms so that the external funding being utilized now should be gradually phased out. To improve on equity, the programme needs re-organisation for representation of interests of the fishers by electing new BVC members with a higher proportion of fishers although it may be argued that BVCs with fishers only will not perform their duties with checks and balances as they may tolerate illegal fishers without any sanctions.

However it has been shown that there is potential in the co-management arrangements for various water bodies in Malawi. The legal framework which is in place and the Decentralization Policy will concretize the initiatives but this will demand commitment from the government.

The co-management arrangement as an alternative strategy to fish resource management in Malawi and a social asset to fishing communities around Lakes Malombe should be promoted. It may in long-term be

cost-effective on the part of government's expenses on the enforcement of fisheries regulations. In some cases the BVCs serve as vehicles through which extension messages and community needs may be assessed within limited time. Legitimacy of fisheries regulations formulated by the resource users will be enhanced.

It is important that more studies are conducted to understand each partner's expectations, socio-economic situation of the communities, biological status of the fish stocks, cultural aspects and technological development of such fisheries. Fisheries co-management may not succeed in certain areas such as an area where it is just used for landing or marketing and where there are no indigenous people to work for the benefit of such a fishery.

Since co-management is a new idea, there is still a lot to learn for the benefit of both the local institutions (BVCs) and the DoF, especially the extension staff. It is important that some form of training opportunities be made available to enhance capacity of the co-managing partners. The PFMP should also involve non-governmental organisations such as the Co-ordination Unit for the Rehabilitation of Environment (CURE) for more technical skills.

The DoF should, without delay, implement the enacted Fisheries Conservation and Management Act that focuses on community participation with legal empowerment and resource ownership as significant attributes. However, there is need to handle the legal issues with caution as any left out gaps will have repercussions on the success of the co-management programmes. The government also needs to be ready to respond to the needs of the communities. Participatory research may be of benefit to the BVCs for capacity building. It is also important for DoF to make use of the existing indigenous knowledge so that appropriate technology packages are developed and disseminated.

A systematic monitoring system is recommended to draw a number of lessons for further improvement of the PFMPs. Issues like composition of the BVC members, roles of local leaders, constitution, extent of participation and weak performance by some local leaders and BVCs and limiting access to reduce the increasing effort should be highlighted for future improvement of the on-going programmes and in designing other co-management programmes.

7. REFERENCES

- Bell, R. and S.J. Donda, Community participation consultancy final report, 1, 15-105. 1993a.
- Bell, R. and S.J. Donda, Community participation consultancy final report, 2, 9-15. 1993b
- Campbell, J. and P. Townsley, Participatory and integrated policy: A framework for small-scale fisheries in Sub-Saharan Africa, 2-3. 1996.
- Chirwa, W.C., The Lake Malombe and Upper Shire River fisheries co-management programme: An assessment. In Norman, A.K., Nielsen, J.R. and Sven-Jensen, S. Fisheries Co-management in Africa. Proceedings from a regional workshop on fisheries co-management research, 18-20 March, 1997, Mangochi, Malawi, 1997.
- Fisheries Department, Annual Frame Survey, 1988-1999 GOM/UNDP/FAO, Chambo Fisheries Research, Malawi: Project findings and recommendations, 1-35, 1995.
- GOM/UNDP/FAO, Project of the Government of Malawi: Component Document, 3-4, 1994.
- Donda, S.J., Development of fisheries co-management in Malawi: Fisheries co-management in Lake Malombe, Malawi. Paper presented at the ICLARM, North Sea Centre, NARS Collaborative Research Project Workshop, 29-31 May, 1995, Hirtshals, Denmark, 1995.
- Donda S.J., F.J. Njaya and M. Hara, Comparative study of fisheries co-management in Lakes Malombe and Chiuta, Malawi, Paper presented during the International Conference on Fisheries Co-Management Project, 23-28 August, 1999, Penang, Malaysia, 1999.
- Government of Malawi, Environment Management Act. 23, 1996.
- Government of Malawi, Fisheries Conservation and Management Act, Government Printer, Zomba, Malawi, 1997.
- Government of Malawi, Malawi Government Decentralisation Policy, Government Printer, Zomba, Malawi, 2-3, 1998.
- Hanna, S.A., Industry participation and fishery management performance, Paper presented at the Fifth Conference of the International Association for the Study of Common Property, Bodo, Norway, 24-28 May, 1995, 1995.
- Hara, M.M. Problems of introducing community participation in fisheries management: Lessons from the Lake Malombe and Upper Shire River (Malawi) Participatory Fisheries Management Programme, *Southern African Perspectives*, 59, 18-19, 1996.
- Hara, M.M., Donda, S.J. and F.J. Njaya, Evaluation of the Lake Malombe co-management programme, Paper presented during the International Conference on Fisheries Co-Management

Project, 23-28 August, 1999, Penang, Malaysia, 1999

- Jentoft, S. and B. McCay, User participation in fisheries management lessons drawn from international experiences, *Marine Policy*, 19 (3), 227-230, 1995.
- Njaya, F. The development of fisheries co-management programmes in Malawi: a comparative case study for Lakes Malombe, Chilwa and Chiuta. In Eide, A. and T. Vassdal, (eds), *IIFET '98 Proceedings*, 1, 260, 1998.
- Sen, S. and J.P. Nielsen, Fisheries co-management: a comparative analysis, *Marine Policy*, 20, 405-407, 1996.
- Tweddle, D., Alimoso, S. and G. Sodzapanja, Analysis of catch and effort data for the fisheries of Lake Malombe (1976-1989), *Fisheries Bulletin*, 11, 1-2, 1994.
- Weyl, O., Lake Malombe artisanal fishery catch assessment, National Aquatic Resource Management Programme, *Technical Report 1*. 15-20, 1999.
- Wilson, J., Lake Malombe and Upper Shire River community fisheries management programme, *SADC Natural Resources Newsletter*, 4, 10, 1993.
- Wilson, J.A., Acheson, J.M., Metcalfe, M. and P. Kleban, Chaos, complexity and community management of fisheries. *Marine Policy* 18 (4), 300-301, 1994.