

# Management Initiatives for the Fisheries of Malawi

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# Management Initiatives for the Fisheries of Malawi<sup>1</sup>

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## Abstract

*Malawi's development policy expresses the need for reduction of poverty, ignorance and disease by the achievement of rapid and sustained economic growth, and improved income distribution. The policy recognises that if the welfare of Malawi is to be further increased economic growth will have to exceed population growth. The performance of agriculture and the exploitation of other natural resources will be critical. Government has stressed the need to ensure that environmental degradation is prevented but a forecasted population size of 12 million by the year 2000 will exert tremendous strains on the country's limited natural resources.*

*The capture fisheries sector in Malawi is an important source of employment, rural income, food security, import substitution and biodiversity. Living aquatic resources provide somewhere between 60-70% of the nation's animal protein supply. Much of the fish is consumed in rural areas and thus contributes to the nutritional needs of some of the poorest people in the country. While the potential importance of aquatic resources in meeting food security and nutritional needs is apparent, so are the inevitable pressures that will be exerted on these resources as Malawi's human population increases at approximately 3.7% per annum.*

*The common property and open access nature of fisheries exploitation and limited alternative income opportunities will exacerbate these pressures. Intervention is essential and the paramount responsibility of the Fisheries Department is the protection of the existing fish resources by means of appropriate research, the collection and analysis of the relevant data and the application of appropriate control mechanisms. This includes an approach to fostering greater community participation in the management process.*

## National Development

Malawi's development policy expresses the need for reduction of poverty, ignorance and disease by the achievement of rapid and sustained economic growth, an improvement in income distribution and a reduction in the instability of welfare for both the individual and the nation. The policy recognises that if the welfare of Malawi is to be further increased economic growth will have to exceed population growth. The need for a population policy has arisen due to high population growth and limited natural resources. The performance of agriculture will be critical, and other natural resources, will, where viable, need to be exploited. Government has shifted its development approach to growth through poverty reduction for the period 1990-95.

Development should not be at the expense of the natural environment and Government has stressed that it will do its best to ensure that environmental degradation is prevented but a forecasted population size of 12 million by the year 2000 will exert tremendous strains on the country's limited natural resources. Land holdings are expected to fall and the number of landless people will rise.

## Sectoral Development

Living aquatic resources have an important role to play in Malawi's development. Twenty percent of Malawi's area is covered by water with Lake Malawi being the largest and most significant water body in terms of fish production (58% in 1992). The others (Lake Chilwa, Lake Malombe, Lake Chiuta and the Lower Shire valley) contribute varying amounts to the total production but are all of high local importance.

The capture fisheries sector in Malawi is an important source of employment, rural income, food security, import substitution and biodiversity. Living aquatic resources provide somewhere between 60-70% of the nation's animal protein supply and nearly 40% of total protein supply. Much of the fish is consumed in rural areas and thus

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contributes to the nutritional needs of some of the poorest people in the country. While the potential importance of aquatic resources in meeting food security and nutritional needs is apparent, so are the inevitable pressures that will be exerted on these resources as Malawi's human population increases.

Sectoral policy objectives aim to maximise the sustainable yield from fish stocks from the national waters; improve efficiency of exploitation, processing and marketing and exploit all opportunities to expand existing, and develop new aquatic resources. Particular care will be taken to protect species biological diversity which is threatened because the aquatic environment, its resources and the people who harvest them, are the recipients of many of the adverse development externalities of other sectors. Agriculture, forestry, urbanisation, industrial development, infrastructure expansion, tourism and mineral extraction all contribute wastes to, or change the physical characteristics of, the aquatic environment in ways which often lead to a depletion of resources, pollution, habitat destruction, reduced biodiversity and loss of amenity. These problems affect the lives of some of the poorest people and those who are often least able to articulate their concerns.

### Artisanal Fisheries Development

Fisheries, and particularly artisanal fisheries development interventions have, more often than not, failed to meet their full potential. Fisheries have a number of important characteristics that suggest management may be necessary. Fish are a renewable resource varying in size according to growth, recruitment and mortality. The resource is reduced in size by natural factors of predation, competition, disease, natural environmental changes and old age; or by human factors such as capture, environmental damage through pollution or habitat destruction. The ability to extract a sustainable catch from the resource each year has formed the basis of fish stock assessment for many years. In its simplest form, if too many fish are caught then the stock size will continue to decrease to a point where either all fish are caught or where it becomes so difficult to catch the fish that the fishermen are unable to make a living from fishing. This is the basis for what has been termed biological overfishing. There is, theoretically, a maximum amount of fish that can be caught on a sustainable basis each year and this is called the Maximum Sustainable Yield (MSY).

Fish are a fugitive resource, that is they cannot be seen or easily enumerated. This leads to a high degree of uncertainty within fisheries. It is understood that fish cannot be extracted without limits, but it is extremely difficult and costly to accurately identify what these limits may be. Capture fisheries are also characterized by the absence of property rights. No individual owns the resource and they are said to be a common-property resource. In the majority of cases anyone is free to catch fish and the fishery is said to be open-access.

Adam Smith's famous "invisible hand" led to the dominant theory that decisions reached individually are the best decisions for society as a whole and as such became the foundation for modern market economic theory. However, this theory may not be valid when applied to common-property resources and Hardin (1968) argued that this was the case when he popularised the commons enigma by use of a metaphorical village commons in what he termed the "tragedy of the commons."

When fishermen find their activities to be profitable it attracts others to enter the fishery. Each new boat that the fisherman introduces brings him both a gain and a loss, the loss being but a fraction of his gain as this loss is shared by other fishermen. Each fisherman is thus locked into a system that induces him to increase his share in the resource without limit, in a resource with limits. In the agricultural and forestry sectors resource constraints have been mitigated through technological growth. Technological development in the exploitation of fisheries is, unfortunately,

ambiguous offering short term gains often at the expense of long term costs due to the absence of enforceable property rights.

A biological analysis will explain stock dynamics and the interactions between the resource, the natural environment and the effects of human interactions. A biological analysis alone however, does not adequately explain the fishery. Biological analysis relates sustainable catch with the amount of fishing effort, but the amount of effort itself is driven by economic forces. A fisherman must decide whether or not to use his time to go fishing or pursue some alternative activity. We need therefore, to include an economic input into any attempt to model and explain a fishery.

### Aquatic Resource Management

There are a number of problems associated with open-access fisheries. The economic stimuli on effort often causes excess pressure on the fish stocks which in turn leads to economic overfishing where society is denied potential benefits from the sector. At open-access it is common for too much capital, in the form of equipment and manpower, to be employed in the fishery and it is consequently said to be overcapitalized.

Open-access equilibria commonly represents fishing beyond MSY in response to the demand and price stimulus. The output achieved at such levels of effort could be achieved at a lower average cost. There is then an incentive to manage the exploitation such that the same output is achieved at this lower cost. Shifting the excess effort, that is capital and labour resources, to other areas of the economy would not only generate a surplus rent from the fishery but could also be an important potential contribution to the overall national economy by increasing output in other sectors. Potential benefits of management may be even greater still as effort may continue to enter the fishery beyond the open-access level<sup>3</sup>. A further benefit is likely to be that the fish population is larger and could be expected to be more resilient to environmental fluctuations (Cunningham et. al., 1985). There are associated costs however. There is the cost of management itself which needs to be compared with the benefits obtainable and there is a short-run sacrifice in order to achieve the long-run gains.

Even if open access occurs at MSY it may still represent economic inefficiency even though the resource is not biologically overfished, because resource rent is dissipated. Because no individual can control the others fishing, an open-access fishery will always operate at a point where marginal cost exceeds price, the only way to prevent this being to manage the fishery.

A further argument for management is the inference of a minimum viable population. Thus far the model has been quite optimistic in that if effort is curtailed the stock will rejuvenate. A minimum viable population theorises that there is a minimum level from which a stock can rejuvenate. The population, once forced below this level, would be unable to recuperate even if effort ceases entirely.

A final argument for the management of fisheries is the prevention of overcapitalisation, that is where too many resources become tied into the exploitation of the fish resource. In the artisanal fisheries of the developing world, capital is particularly scarce, and this excess capital could be transferred from fisheries or better still prevented from entering in the first place<sup>4</sup>.

3. There are a number of reasons for this, investment decisions made on over optimistic estimates and government subsidies for example  
 4. Cunningham et. al. (op. cit.) distinguish two kinds of overcapitalisation. The first, associated with open-access, is the extra resources used to derive an output beyond MSY that could be taken with far fewer resources at some output level below MSY. Secondly there is the chance that effort will overshoot the bioeconomic equilibrium level as effort increases rapidly in the development stage of a fishery and the asymmetry between entry to and exit from the fishery.

A possible solution to over-capitalisation is to permit or mandate sole ownership of the fishery in question by allocating property rights. A sole owner would attempt to equate the marginal cost to the marginal revenue. In most countries however, it has been thought politically or administratively impossible to implement sole ownership approaches. Subsequently, in much of the world, attempts to reduce effective effort have focused on various alternative methods that seek to regulate fishermen as a group. These alternatives have produced only a few successes despite years of application and refinement in temperate single species fisheries (Pearse, 1974). The fact that most tropical fisheries are small-scale, dispersed and mobile exacerbates the problem.

Development has often followed a process of expanding the fishery from an un or underexploited state to a state of overexploitation or stock collapse. Many of the world's fisheries are now exploited at a level greater than the optimum level required to achieve stated objectives. Without some form of regulation the full benefits of development may not be realised. The development of an unexploited stock leads to the generation of consumer surplus only and no producer surplus and further development will lead to a reduction in the consumer surplus. The development of a fishery may not increase social welfare, it could, perversely, reduce it. Without some regulation of effort, fisheries related assistance sooner or later proves futile, as far as the socio-economic conditions of the fishermen and the society's long term interests are concerned (Panayotou, 1989). Lieberman (1986) notes that it is unclear what conditions would develop in the absence of intervention and he asks whether acceptable situations would ultimately prevail and if scarce resources used for management could be better utilised elsewhere. The lack of accuracy and precision in measuring the effects of management hinders our ability to evaluate management actions. Measuring both costs and benefits necessitates the use of multiple proxies or surrogates and a certain degree of subjectivity will consequently persist

It is generally concluded that without some form of regulation of effort there is little chance of achieving sustainable development through the fisheries sector. If we accept this it becomes important to specify the goals of management.

### Objectives of Fisheries Management

Rather than the exclusive use of MSY as a management goal, it has, in recent years, become common to view fisheries management more for the benefit of people than the fish resource themselves. This has led to arguments against economic overfishing and leads to the concepts of Maximum Economic Yield (MEY). A further development has incorporated social criteria and led to the hypothesis of social overfishing and a Maximum Social Yield (MScY). Whatever the goal of fisheries management it is important that the objective is clearly identified before any intervention is attempted. The majority of the world's artisanal fisheries, particularly those in the developing tropical countries are typified by their multi-species and multi-gear nature. In a multi-species fishery the optimisation of sustainable catch is evasive as certain species will decline while others emerge in response to increasing fishing effort. In such a situation it is likely that certain species will be overexploited while others are underexploited. The situation is further complicated by the natural fluctuations of the individual species and their interactions with other species.

### Regulation

Effective action must deal with the problem of allocating scarce resources among competing groups of fishermen and finding practical methods of enforcing that allocation. Any such technique must recognise the inherent physical, economic and social difficulties in enforcing restrictions where economic incentives invite violation.

The choice of management technique depends on the features and circumstances of the fishery. For a regulation to be politically acceptable and administratively feasible it should have the support of the majority of the fishermen. However, it is often unlikely that fishermen will be in favour of regulatory measures, as by and large these will propose a reduction of effort and thus retirement of fishing units and labour. Measures are needed to get fishermen voluntarily to advance their collective interests at the expense of their private ones. Unless attractive alternatives are proposed, in the form of alternative employment for example, such measures are unlikely to find favour with the fishermen. Even where alternatives are offered they may not be accepted as the fishermen are often emotionally linked to their traditional way of life and see any change as a threat to their traditions. The extent to which fishermen believe the regulations are in their own best interest, and are appropriate will affect their willingness to accept and adhere to such regulations. Management must take account of the distributional consequences of the regulation.

### Regulation Techniques

The majority of regulatory techniques have been developed to address problems associated with commercial fisheries. It is important to understand the limitations of these when applying them to the small-scale sectors of a fishery.

Regulations which do not restrict access have been and continue to be commonly used in the management of fisheries resources. However, as they do not deal with the problem of open-access they are unable to improve the long term economic position of the fishery.

Catch limits or quotas are an established way of regulating fishing effort in developed countries. However, catch limits in isolation are, even if successful, only capable of solving problems of resource conservation. The problems of over-capitalisation and economic overfishing remain. Catch limits are commonly used in conjunction with closed seasons, the fishery being closed once a Total Allowable Catch (TAC) has been achieved. There are no controls on the amount of effort attracted into the fishery, and increased effort leads to quota realisation in a shorter time. Information requirements are high and quotas are difficult to police as it is to the fishermen's advantage to under report, and the problems of spatial distribution and fluidity make it particularly difficult when dealing with artisanal fisheries.

Restriction of gear type usually the more efficient gears has the effect of raising the average cost of fishing and reducing the overall cost effectiveness of the operation. Gear restrictions of this type are inefficient and inequitable on both economic and sociocultural grounds. They penalize the more efficient gear types forcing their operators to use alternative methods. Gear that is restricted on the grounds of biological damage tend to place the poorer fishing folk at a comparative disadvantage. A restriction on these methods should be accompanied by measures to allow adoption of alternative sources of income or subsistence.

Restriction of gear selectivity does not restrict or control effort but does affect the age of the fish at first capture. Such systems strive to achieve and maintain the most productive or valuable age structure. Enforcement is likely to be difficult and costly due to the spatial distribution and dynamics of artisanal fisheries and because the small scale fishermen are likely to oppose such legislation. Gear selectivity restrictions in the absence of effective control of effort and a resolution of the fundamental allocation problem is however, likely to accomplish little.

Species size restrictions are a common indirect way of limiting catch. They may be used to lower either growth or recruitment overfishing. Information requirements are high and enforcement costs are also likely to be high.



Closed seasons and areas lend themselves to management strategies and have a wide distribution among tropical fisheries, evolving both inadvertently and intentionally in both marine and freshwater environments. Exposure to such measures in the past suggests familiarity to the fishermen. They have been shown to have a degree of acceptability among fishermen which enhances their legitimacy. As a substitute for imposed gear restrictions they impose less of a penalty on poor fishermen. Finally but importantly they are comparatively easy to enforce as infringement is usually highly visible to someone in a position to report infractions.

The techniques discussed above do not address the problems of open-access. They may serve to protect stocks biologically but do nothing to improve economic efficiency.

Resource rent charges or taxes are able to correct the problems of open-access exploitation without disrupting what are seen as desirable effects of competition and as such have often been proposed by fisheries economists. A charge is levied to reduce profitability and thus discourage fishing so that open-access effort moves toward a more optimum level. In developing countries with often poorly functioning tax collection systems and with a dispersed small scale fisheries sector where fishermen earn relatively low incomes, taxes are inappropriate in both economic and political terms. With the heterogeneity and distribution of the sector, variability in production and prices, the determination of the appropriate charge and its collection would be prohibitively difficult.

Licensing is perhaps the most widely used form of limiting entry and effort in a fishery. It seeks to control the amount of effort by directly regulating those who can and cannot fish. The licensing of gear (boats or nets) has proved to be a reasonably effective mechanism in accessible fisheries. As decentralizing control to district level etc. increases the accessibility then gear licenses should still have a role to play. The effectiveness of such a technique can be improved by linking credit and other benefits to license holders. Public finance research in other sectors has suggested that tax payers are more willing to pay locally imposed taxes (or license fees) because they have greater ability to ensure that the funds raised are spent for programmes of direct interest to them.

### Managing Artisanal Fisheries

The fundamental problem of small-scale fishermen around the developing world is their persisting absolute and relative poverty despite decades of remarkable overall fisheries development and national economic growth.

Spatial distribution and large numbers all have a serious effect on the data collection system and make administration a formidable task. Registration is a way of enumerating fishing units, either for information purposes or to ensure they meet certain criteria. Virtually all management approaches require, or would be facilitated by such registration.

Fishermen are often locked into what has been termed a short run survival strategy and are unable to curtail effort in order to preserve stocks or increase economic efficiency for to do so would mean going without food or income. The mobility of fishermen into and away from a fishery is an important consideration when formulating a management strategy. Asymmetry between entry and exit of capital and labour is generally considered to exist. Small-scale fishermen are often occupationally and geographically immobile. Entry into a fishery is often easier than exit. Fishing assets are not easily liquidated as they have few if any alternative uses. Alternative employment opportunities are often scarce or the fishermen are ignorant of alternatives due to the isolated nature of fishing communities. Any management strategy must recognize such characteristics to be effective. For example fishermen

water. Assistance from other Departments, like the Police was hard to come by due to poor communication channels.

All natural water bodies in Malawi are state owned and therefore the Fisheries Department, as a Government body, has the mandate to manage them. The management strategy has been entirely biologically oriented. Management regulations were developed, based on scientific research findings and passed on to the fishing communities without their consultations. These were then enforced by the enforcement section of the Department. The enforcement section has staff members at each district station. Deferent regulations were tailored to suit each particular fishery.

Centrally planned, top-down renewable natural resource (RNR), management meant that the regulations were imposed on the fishing communities without consultation and with little or no education given to the communities on how these regulations were formed and on what basis.

Although a licensing system was introduced in Malawi, for the purposes of controlling fishing effort entering into the fishery, it has not been possible to achieve this goal in the artisanal fishery sector. The main reasons have been that the traditional fishermen are widely spread all over the lake-shore, which makes it impossible for a full coverage of the whole area by the licensing teams, who happen to be part of the enforcement team, and the lack of appropriate institutional structures that could be used to do the licensing.

Due to financial and structural problems of the Fisheries Department, and the Government as a whole, the enforcement team became weak and ineffective. Failure to create awareness and consult with the fishing communities on the formulation of regulations, made it almost impossible for such regulations to succeed.

With these experiences in mind and responding to a greater awareness of the socio-cultural constraints on fisheries management the need for a new approach was recognised. It was argued that there are approaches which may both increase the effectiveness of management and reduce the costs in the long term. Thorough reviews have paved the way for the implementation of such a new approach<sup>5</sup>.

### Participatory Aquatic Resource Management

Communities dependent on common property resources have adopted a variety of arrangements by which the resource may be managed. Several forms of traditional management, based on property rights have evolved. Such community based approaches apportion property or rights to the community, to the fishermen within a community or to an organization of fishermen allowing a degree of self control rather than attempting to control the fishery directly. Members are able to reap the benefits of their own restraint as long as they are able to exclude others from the resource.

Community based regulation is sensitive to a number of stresses which lead to the loss of community control. Regulations which were viable in early stages of history were weakened, if not dissolved, as human populations grew, new technologies emerged, or species originally harvested for local food use became commercialised. High population growth, technology-led development and commercialization have all contributed to the demise of community based regulation. Nonetheless there has been increasing interest in using such traditional forms of aquatic resource ownership as models for fisheries management that offer an alternative to open-access.

5. Community Based Management for the Fisheries of Malawi (Bland, 1992), Chambo Fisheries Research Project (FAO, 1993), Community Fisheries Management Programme for Lake Malombe and the Upper Shire River (Bell and Donda, 1993).



It is the responsibility of governments to implement general policies which benefit artisanal fisheries and, more specifically, to formulate, institutionalize, encourage and support new management policies that link limited access with local participation at either the community or district level. There is a need for international organizations to stress, especially through training programmes and pilot projects, the need to pay more attention to management strategies that link limited access and local participation.

A revival of community based systems must include the removal of the stresses which caused their downfall. The resource must be explicitly allocated to the artisanal fishermen, encroachment and dualistic conflict must be prevented by strong legal measures. The resources should then be allocated to the communities enabling entry to be regulated and exit gradually encouraged by the provision of alternative employment opportunities. However, as fisheries administrators search for alternative strategies to rehabilitate or complement ineffective government regulatory mechanisms, there is a very real danger that too much will be expected of such traditional management practices. Management strategies which are still both strong and relevant must be fitted into a more comprehensive strategy which includes strong external support.

The establishment of sole ownership by a group can lead to a number of benefits. The resource may be exploited by a group sensitive to the consequences of misuse, each having a vested interest in keeping the resource viable. Conflict among fishermen may be reduced and a more flexible adjustment to changes in technology, markets, resource characteristics and the socioeconomic structure of the fishing community may be permitted.

To combine limited access with local participation and control, local organizations are needed which command the loyalty of the fishing communities in which they exist, which make economic sense, and which are capable, with proper external assistance of managing multispecies fisheries over the long term. Unless such organizations give fishing communities a major economic stake in managing fish stocks in a socially compatible way they will fail as a management mechanism.

In many countries fishing communities are among the poorest members of society and often considered to be of a low status. Organizations such as district councils rarely represent the interests of such fishermen and it has been concluded that under such circumstances, separate participatory organizations need to be set up and run by the poor themselves. In some cases their establishment may be initiated from within, in other cases external assistance is required. In either case, external support of some sort is needed either in terms of legally sanctioned and upheld policies, or in terms of more direct assistance in establishing and running an effective organizational structure.

A community approach should stimulate local initiatives to undertake management and development activities and should lead to a more rational use of the resource. Government agencies should act to support the local community, through education and technical assistance, and bring about collaboration among its residents for problem solving. Community based management will face many of the problems experienced by state management strategies. Control and reduction of fishing effort by either self management or governmental management will be easier in communities where a broad spectrum of employment opportunities exist. In communities where alternatives do not exist, any restrictive strategy is likely to be difficult to implement and enforce.

## Pilot Approach

Lake Malombe is a relatively small shallow lake lying immediately south of Lake Malawi and forming an expansion of the bed of Lake Malawi's outflow, the Shire River. Malombe covers an area of 390Km<sup>2</sup> with a mean depth of 4m and is fished by around 4,000 fishermen (1992) using 700 planked boats. Fish landings in 1992 totalled 8,000 tons which was approximately 12% of Malawi's total fisheries production. An illustration of the distribution of fishing effort in terms of boats, fishermen and gear types is given in the figures at the end of the paper as is an indication of catch levels.

Not all fisheries problems can be solved with reference to fisheries alone. Efforts to improve incomes and living standards of people in fishing communities also involve development of alternative economic opportunities. An integrated development approach has been widely advocated since the early 1980s. Such an approach must also address the problems of rapid population growth which is seen as a fundamental threat to the sustained exploitation of fisheries resources and a major constraint to effective management. If the communities enjoying exclusive use rights grow without limiting entry into the fishery a common-property situation will re-emerge. The fundamental problems of population growth must be addressed.

Such an integrated approach is being incorporated within the Participatory Fisheries Management Programme (PFMP) for Lake Malombe and the Upper Shire River.

The PFMP is divided into seven components:

1. Policy and legislation;
2. Research, monitoring and extension messages;
3. Community participation;
4. Public relations and extension;
5. Licensing;
6. Compensation and Income Generating Activities;
7. Law enforcement.

The institutional arrangements of the PFMP involve both existing and newly established structures. The new structures include the establishment of a Participatory Fisheries Management Unit (PFMU), which is headed by the Principal Fisheries Officer in Mangochi District. A Fisheries Management Policy Committee (FMPC) will carry out regular reviews of management policy with inputs from Fisheries Research Unit, Planning, Monitoring and Evaluation Unit, management staff and fishing communities.

The Fisheries Research Unit (FRU) will continue to monitor fisheries and feed information in the form of extension messages to Fisheries Department headquarters, other branches of Government, PFMU and fishing communities. The Planning, Monitoring and Evaluation Unit will monitor the socio-economic status of fishing communities and feed this information to the PFMU.

Two levels of user community groups will be formed, Beach Village Committees (BVC), and a lake-wide coordinating body, referred to as the Lake Malombe Fishermen's Association (LMFA).

The implementation of the PFMP requires periodic review of Fisheries Department Policy and legislation, (particularly subsidiary legislation in the form of regulations). This is necessary because the status of the fishery is likely to change with time, depending on the impact of the programme. It is hoped that user community institutions will develop in the direction of sustainable management of the fishery in which case alterations of policy and regulations will be in the direction of progressive transfer of management authority to community institutions.

The activities of the FRU are central to the implementation of the PFMP. It will investigate and monitor the status of the fish populations and the fishery. The FRU will convert research results into extension messages accessible to community leaders and users, Fisheries Department staff, other branches of Malawi Government and other extension channels.

It is planned that research and monitoring will be covered by three activities:

- Continuation of the current data collection and analysis systems.
- A study of the aquatic ecology of Lake Malombe and the Upper Shire River, which is particularly important to gain a greater understanding in order to monitor the effect of management initiatives.
- Socio-economic studies around Lake Malombe and the Upper Shire River, such studies will allow insight into the social dynamics of the changes in resource access rights that will result from the initiation of such programmes. They can identify, evaluate and suggest adjustments for the many ways in which such programmes may depart from the expectations of managers. Findings will be transmitted to user communities on a regular basis.

Data from these activities will be used as the basis for extension messages. A key aspect of the PFMP is the preparation by the FRU of accessible extension materials based on research results. The preparation of the materials and messages will incorporate feedback from communities in the revision of materials. This will be an ongoing and interactive process, with regular updates in relation to responses and current circumstances.

The heart of the PFMP is the establishment of community-level institutions to provide for two-way channels of communication between the fishing communities and Fisheries Department and to progressively assume responsibility for management of the fishery and form the basis for a communal, (as opposed to open), access fishery. This required the formation of a Community Liaison Unit (CLU), which is a sub-unit of the PFMU. The principal features of the CLU are summarised as follows:

- To initiate a dialogue with the fishing communities of Lake Malombe and Upper Shire River;
- Through this dialogue, to facilitate the formation of community-level institutions through which to promote community management of the fishery; it is expected that ultimately, this will involve Beach Village Committees (BVC's), and later, a body through which to coordinate the BVC's of the area, the Lake Malombe Fishermen's Association;
- To work with community-level institutions to promote and develop dialogue between Fisheries Department and fishing communities; to facilitate the identification of fishing community problems, formulation of solutions, monitoring of implementation of solutions by communities, and evaluation and adjustment of solutions;
- To work with community level institutions in transmission of extension messages to the fishing communities, and in feeding back responses to messages of communities to Fisheries Department.

The priority objective of the CLU is to develop relations with key members of the fishing communities, and its primary task will be to facilitate the formation of community-level institutions. The objectives of forming Beach Village Groups (BVG's) and BVC's are as follows:

- To provide channels for dialogue between user communities, traditional leaders and Fisheries Department;
- To provide fora in which users may identify their problems, formulate solutions, organise implementation of solutions, evaluate progress and adjust solutions;
- To provide the basis for community control over access to the fishery;
- To provide the basis for representation of users at higher level fora;
- To provide a channel for transmission of extension messages to users and feedback the messages to Fisheries Department.

The BVC's are the link between the Fisheries Department Technical Assistants and the group as a whole. The user community is overwhelmingly male and the Fisheries Department facilitators will encourage the involvement of women in beach groups and BVC's.

Licensing is fundamental to the PFMP, since it provides the legal mechanism for converting an open access fishery to a communal access fishery. It also provides the legal basis for removal of unapproved gear from the fishery. Licences will be restricted to registered gear owners only.

Strong enforcement is an acceptable and sometimes necessary supplement to community-based management. For smooth implementation of the programme, and to ease the tension that develops between the Fisheries Department and the fishing communities it is important that:

- a. The regulations are fully agreed and understood by the majority of the user community;
- b. The enforcement personnel avoid any form of abuse of human rights, (ie illegal entry, arrest, beating, damage of property etc.)
- c. When requested to do so by users, the enforcement personnel treat as strictly confidential the source of information leading to enforcement action;
- d. Enforcement personnel remain impartial and avoid favouring the interests of particular individuals or groups.

This new strategy is a combination of both the biological and social science approach in the management of the fishery. It involves making use of the results of scientific research, and passing on information to the fishing communities as extension messages.

Although successful implementation of such programmes require a lot of time and dedication on the part of the government, it also requires devolution of power from the government to community, a situation which is not always favoured by many administrators. Allowing the community to fully participate in the decision making process will establish a 'bottom-up' approach to management. To achieve this will call for institutional development which caters for the needs of the fishermen. Training is an important aspect in the programme for both the fishing communities and the Fisheries extension staff, so that the fishermen can understand why there is need to manage the fish resource, and how to effectively disseminate extension material respectively.

### Concluding Remarks

Traditional management forms are unlikely to be a panacea to all the problems of small-scale fisheries management and it is important that too much is not expected of them. However, considering the substantial problems faced by the Fisheries Department, any alternative approach that increases the legitimacy of the

regulation and has the potential for reducing enforcement costs is worth considering. A community based management approach may offer such an alternative. The fishermen must be actively involved at all stages and must clearly understand what decisions are made and why, and should be part of that decision making process. Such a decentralisation of authority will not come easily to either government or community.

Regulation is a costly process for both regulators and regulated. Planning likewise involves costs. Saving short-term costs by failing to accommodate fishermen's participation in the planning process may lead to greater long-term costs if it turns out to be ineffective or unenforceable. Delegation of a portion of the planning process to a group of fishermen will help in determining what actions are acceptable to the fishermen. Sharing the planning process should enhance local acceptance and thereby reduce the costs of enforcement.

Whether the practicalities of re-establishing community regulation can be solved remains to be seen but once governments are convinced of the potential benefits of such dialogue they may become more receptive to the principles regulatory devolution where local circumstances warrant an attempt at community based management regimes.

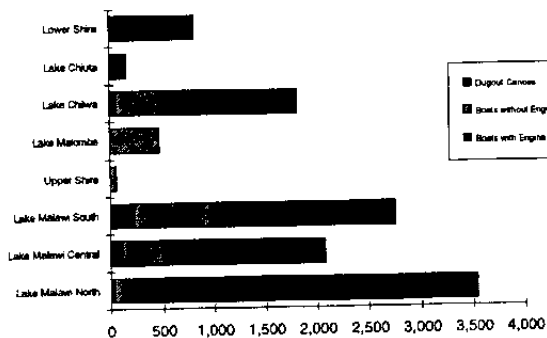
#### References:

1. Bell, R.H.V. and S.J. Donda 1993 Community fisheries management programme, Lake Malombe and the Upper Shire River. Fisheries Department, Government of Malawi
2. Bland, S.J.R. 1991 Managing artisanal fisheries and their development. Centre for Marine Resource Economics, University of Portsmouth
3. Bland, S.J.R. 1992 Community based management for the fisheries of Malawi. Overseas Development Administration of the United Kingdom, Fisheries Department, Government of Malawi
4. Cunningham, S., Dunn, M.R. and Whitmarsh, D. 1985 Fisheries Economics. An Introduction. Mansell Publishing Limited, London
5. FAO 1993 Fisheries management in south-east Lake Malawi, the Upper Shire River and Lake Malombe. CIFA Tech. Paper 21
6. Hardin, G. 1968 The Tragedy of the Commons. Science 162
7. Lieberman, W.H. 1986 Towards improving fishery management systems. Marine Policy 10(1)
8. Panayotou, T. 1989 Management concepts for small-scale fisheries - economic and social aspects. FAO Fish. Tech. Paper 228.
9. Pearse, P.H. 1974 Property rights and regulation of commercial fisheries. J. Bus. Admin.36(7)
10. Tweddle, D., Alimoso, S.B., Sodzapanja, G. 1989 Analysis of catch and effort data for the fisheries of Lake Malombe 1976 - 1989. TFAP/1 (1991) Government of Malawi.

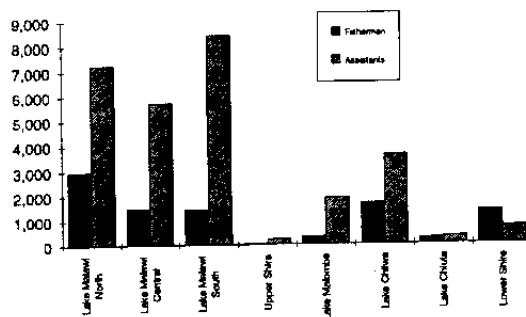
# Distribution of Boats, Fishermen and Gear Types by Water Body for 1993

Serial No	Name of fishing beach	Number of operating crafts				Number of Fishermen	Number of assistants	Number of operating gear															
		Boats with engines	Boats without engines	Dugout canoes	TOTAL			Gillnets	Longline	K'buzi seines	Crinoids nets	Mosquito nets	Traps	Hand lines	Scoop nets	Chambo seines	Nkacha seines	Cast nets	Psyallo	Spears	Other		
1	Lake Malawi North	34	80	3,426	3,540	2,970	7,231	5,171	387	227	683	116	59	945	0	4	0	0	0	0	0	0	0
2	Lake Malawi Central	116	393	1,576	2,085	1,493	5,795	3,896	405	208	451	35	33	393	16	19	0	0	0	0	0	0	0
3	Lake Malawi South	233	731	1,794	2,758	1,841	8,426	2,756	200	200	493	10	49	1,098	0	45	29	0	0	0	0	0	18
4	Upper Shire	0	45	17	65	53	224	4	0	9	0	5	23	36	0	19	7	0	0	0	0	0	0
5	Lake Malombe	1	459	1	471	306	1,903	356	54	49	0	13	0	10	0	3	227	0	0	0	0	0	9
6	Lake Chilwa	64	597	1,362	1,823	1,662	3,616	3,473	706	335	5	0	21,252	0	5	0	0	0	0	0	0	0	0
7	Lake Chiwio	1	31	131	163	227	307	598	70	35	0	4	2,286	32	1	0	0	0	0	0	0	0	0
8	Lower Shire	0	15	804	819	1,366	713	1,195	196	62	0	4	3,077	385	54	0	225	5	4	4	27	0	0
TOTAL		440	2,164	9,113	11,724	9,517	28,152	17,443	2,112	1,124	1,632	183	26,779	2,850	79	90	263	225	3	4	54	0	0

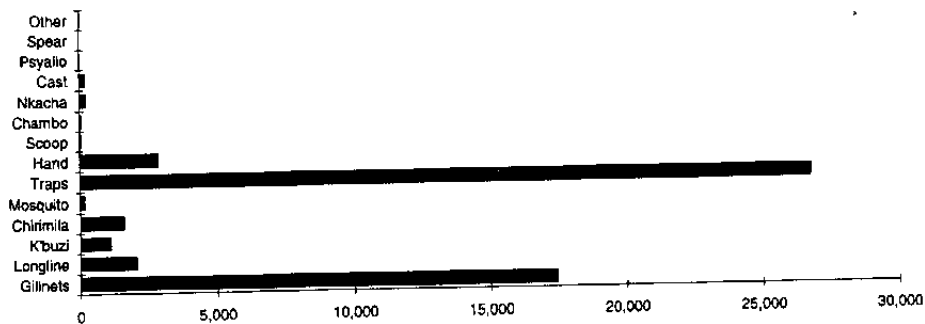
### Boats by Area



### Fishermen by Area



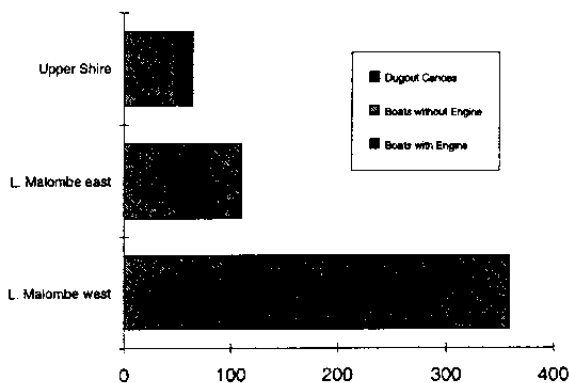
### Gear Types



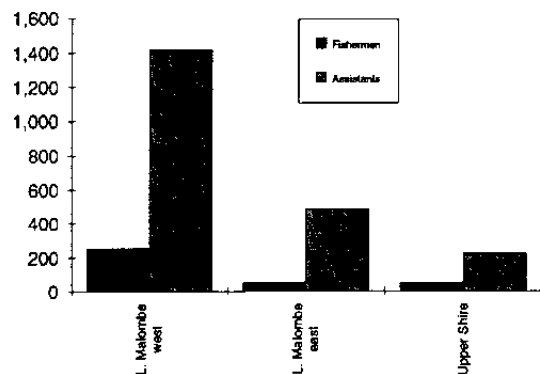
# Distribution of Boats, Fishermen and Gear Types for L. Malombe and Upper Shire River for 1993

Serial No.	Name of fishing beach	Number of operating crafts				Number of Fishermen	Number of assistants	Number of operating gear								
		Boats + engines	Boats - engines	Dugout canoes	TOTAL			Gillnets	Longline	K'buzi seines	Mosquito nets	Traps	Hand lines	Nkacha	Chambo seine	Other
1	L. Malombe west	1	358	1	360	252	1,417	341	45	40	12	-	10	174	3	9
2	L. Malombe east	-	111	-	111	54	483	17	9	9	1	-	-	53	-	-
3	Upper Shire	-	48	17	65	53	224	4	-	8	5	23	36	7	19	-
	TOTAL	1	517	18	536	359	2,124	362	54	57	18	23	46	234	22	9

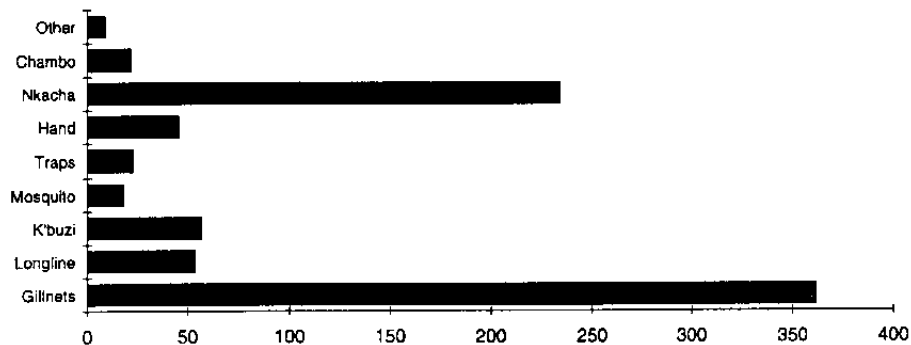
## Boats by Area



## Fishermen by Area



## Gear Types

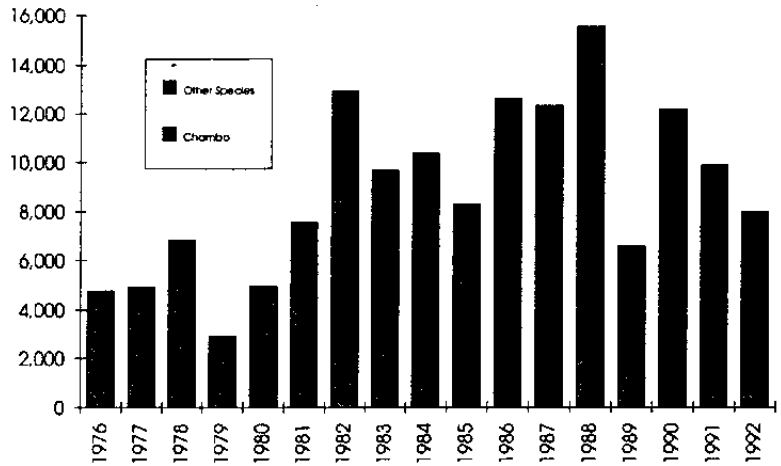


NB. Although the number of gillnet units, exceeds all other gear types, the majority of the production comes from the Nkacha and Kambuzi seines.

# Catches of Chambo and Other Species in Lake Malombe 1976-1992

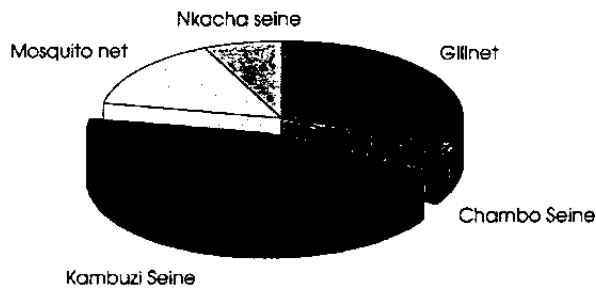
	Chambo (tonnes)	Other (tonnes)	Total Tonnes)
1976	4,118	658	4,776
1977	4,161	776	4,937
1978	4,921	1,920	6,841
1979	1,956	961	2,917
1980	4,344	625	4,969
1981	6,017	1,542	7,559
1982	8,484	4,452	12,936
1983	6,055	3,622	9,677
1984	6,678	3,697	10,375
1985	5,159	3,155	8,314
1986	4,969	7,649	12,618
1987	2,023	10,307	12,330
1988	1,900	13,635	15,535
1989	1,295	5,312	6,607
1990	522	11,678	12,200
1991	522	9,378	9,900
1992	545	7,455	8,000

Lake Malombe Production



	Catch(t)
Gillnet	2,008
Chambo Seine	218
Kambuzi Seine	2,930
Mosquito net	996
Nkacha seine	453

Catch by Gear Type in 1989



N.B. Little distinction is now made between the nkacha and mosquito nets. Many of the nkacha seines and kambuzi seines have panels of mosquito netting.