An investigation of local community contributions to the Malawi College of Fisheries curriculum: A case study focussing on the Chambo fishery.

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ABSTRACT

The aim of the study was to investigate local community contributions to the existing Malawi College of Fisheries curriculum with a focus on Chambo fishery. Chambo fish (*Oreochromis species*) is the most favoured fish in Lake Malawi. Chambo catches have declined over the years. Responding to the declining catches, the Fisheries Department is engaged in a number of management options to address the issues. Most of these management options are governed by scientific recommendations and do not consider the socio-economic situation of the people who are dependant on fishery.

This approach to fishery has influenced the Malawi College of Fisheries curriculum. The existing curriculum is product-centred, developed by a consultant. During the development of the curriculum, there was little consultation with the lecturers and no consultation with the local communities who are using the resource. The fishing communities have been fishing for a long time and have acquired knowledge, skills and experience worth investigating for its potential role in improving the existing curriculum.

Through the use of interviews, focus group discussions and workshops with local communities local knowledge was identified for inclusion into the curriculum. A review of the existing curriculum revealed that it has primarily technical focus, grounded in the protection, control and management of the fish stocks, while the local knowledge has a practical focus based on existing practices and requiring an understanding of the sources of the issues. There is also more emphasis on a historical perspective and the context in which fishing practices take place at the moment. It was evident from the study that local communities have much of knowledge, skills and experience gained over the years of fishing, and if properly utilised, it can improve the MCF curriculum. I therefore recommend in this study that the curriculum be reviewed in order to integrate and draw on the local knowledge through a deliberative and participatory process between the local communities and the government so that it addresses the needs of the local communities and improves the training of the extension workers.

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LIST OF ACRONYMS AND ABBREVIATIONS

AMF	Analytic memo focus group
AMI	Analytic memo interviews
AMW	Analytic memo workshop
BVC	Beach Village Committee
FAO	Food Agriculture Organisation
GDP	Gross Domestic Product
GoM	Government of Malawi
FGP	Focus group person
KI	Kela-Makawa interviews
MCF	Malawi College of Fisheries
MSY	Maximum sustainable yield
NSSD	National Strategy for Sustainable Development
UNDP	United Nations Development Programme
WAG	Workshop A group
WBG	Workshop B group
WSSD	World Summit for Sustainable Development

CHAPTER 1
INTRODUCTION

"An important contribution that indigenous people can bring to the educational arena is a long-term perspective spanning many generations on observations and experimentation, which enrich the relatively short-term, time bound observations"
(Kawagley and Barnhardt 1999:134).

1.1. Introduction

This chapter introduces the research. It starts by introducing the context in which the research took place. It discusses the geographical position of the area under study and outlines the orientation to the research process. It also details the main focus of the research, by highlighting the research question and the goals of the study. It finally provides an overview of the thesis by introducing each chapter.

The study was conducted in two areas (Kela-Makawa, area 2.1 and Malindi, area 2.2) on the South East Arm of Lake Malawi. The South East Arm of Lake Malawi lies 13° 50' to 35° 10' East and 13° 44' to 14° 25' South and stretches about 80 km from the northern end to the southern outflow into the Shire River, the lake's outlet (FAO 1993) (see figure 1.1). The area is the shallowest part of the lake and was particularly chosen for this study because its shallowness provides an abundance of natural food for the fish, as Chambo are primarily plankton feeders.

The study will focus on the Chambo fish (*Oreochromis species*) because of a number of reasons: Chambo is the most favoured fish in Lake Malawi; it also forms the basis of very important commercial fisheries for both industry and small-scale artisanal fisheries in the South East Arm of Lake Malawi (see section 2.2, and see figure 1.1). The Chambo catches began to decline over the past years due to demand at the market (see section 2.5).

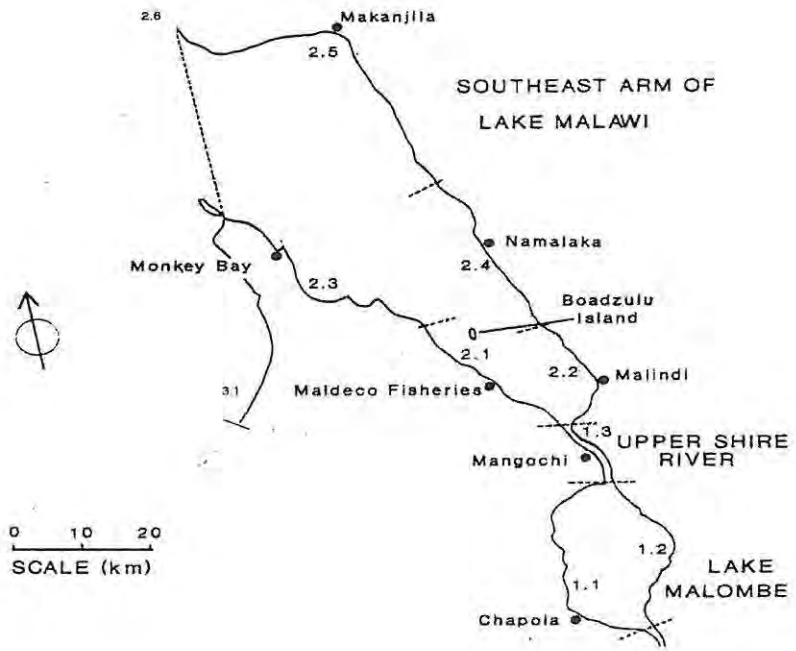

Figure 1.1 Map showing the South East Arm of Lake Malawi

The decline of the Chambo fishery is a national concern and in the Malawi report to the World Summit for Sustainable Development (WSSD) held in Johannesburg in 2000, Malawi highlighted its concern over the decline, and expressed its commitment to come up with measures to restore the Chambo fishery to its maximum sustainable yield by 2015 (GoM, 2003). Responding to this commitment, the Fisheries Department launched the 'National Save the Chambo Campaign,' which aims to mobilise all Malawians to embark on a programme of sustainable use of the Chambo, in order to restore the stocks to the pre-1990 levels. Among the strategies for achieving the programme is the need to increase private-public awareness and acknowledgement of the important role local communities play in the management of the fishery (GoM, 2003).

In the context of the above strategy, the existing Malawi College of Fisheries curriculum has a strong focus on scientific knowledge of the conservation of the Chambo with little recognition of local community contributions to the fishery. This study therefore investigates local knowledge and their contributions to the existing curriculum with a view to informing a review of the curriculum, which will potentially contribute to the national commitment to restore the Chambo fishery by 2015.

1.2 Introduction to the Malawi College of Fisheries curriculum

The Malawi College of Fisheries (MCF) is situated on the South East Arm of Lake Malawi below Boadzulu Island on the lake shore (see figure 1.1). It was established in 1964 as a fisheries training centre basically to conduct courses in fishing and fish processing. Later it started to run one year courses in fisheries management and the graduating students were sent to various fisheries stations to implement fisheries management programmes.

The college was restructured in 1994 and was made a full college and is managed by Fisheries. The department responsible for three different courses in Fisheries Management:

- A pre-service course where O or A level students with a good science background come to the college to be trained in Fisheries Management. They join the Fisheries Department as technicians in different sectors once they graduate.
- In-service courses for serving officers who, after one year of study take supervisory positions in the field.
- Tailor' made courses for fishing communities. These are normally short courses ranging from one to two weeks depending on the training requirements. At times it also trains students from other countries in the region in the areas of aquaculture and resource management.

The MCF has three administrative departments from which different courses/subjects have been developed. The departments are:

- Department of Fisheries Science and Resource Management,
- Department of Technological Development,
- Department of Rural Development.

Most of the courses that are run at the college are scientific in nature and are biased towards resource management, with less emphasis on rural development.

Fish resource management in Malawi has mainly been based on a centralised approach for years since the period of colonial rule (Njaya, 2001). This form of traditional management largely died out with the commercialisation of the fishing industry during the first two decades of the last century (Chirwa, 1997). This change in management practice also coincided with population growth and a changing political economy in Malawi characterised by debt and the impact of structural adjustment policies. This has resulted in much mismanagement of resources as the government claims to have full responsibility and control of the available resources, and tends to neglect the contributions of local communities.

1.3 The research focus

The main focus of the study is to investigate local community contributions to the development and review of the MCF curriculum. It is based on inter-epistemology orientation. The study aims to engage in a process of deliberation by involving various stakeholders (learners, fishing communities, business people and lecturers) in the development of the curriculum. According to Lotz (1999), when developing new courses, it is important to know and to take account of the nature of the context and to be clear about the specific needs of the participants. The research therefore focuses on the potential curriculum contributions of local communities as a result of the establishment of a deliberation process. As indicated by Cornbleth (1990:5), a curriculum is an ongoing social process comprised of "the interaction between teachers, students' knowledge and milieu" and she describes this interaction as "curriculum in practice" or "curriculum in use" (see section 2.7). The study also recognises the importance of the knowledge, skills and experiences that the fishing communities have and that it is through deliberations involving the local knowledge of fishing communities with the Fisheries Department (through the Malawi College of Fisheries) that the knowledge can be utilised and the curriculum can potentially become more contextually situated.

1.4 The research question

As indicated earlier, the main aim of the study is to explore local community contributions to the Malawi College of Fisheries curriculum. The research question is: What contributions can local communities make to the existing Fisheries Management curriculum of the Malawi College of Fisheries? In order to explore the research question in more depth, I framed three research goals to guide the research process:

- Establish a research-based deliberation process in which local knowledge of the Chambo fishery is solicited.
- Identify potential local community contributions (on the Chambo fishery) to the Malawi College of Fisheries curriculum.
- Review the existing Fisheries Management curriculum to identify how community contributions focusing on the Chambo fishery may be incorporated.

The research aims to provide recommendations that will inform a revision of the Fisheries Management curriculum at the Malawi College of Fisheries and local knowledge of the fishing communities as per the findings of the study.

1.5. My role at Malawi College of Fisheries

I am a lecturer at the Malawi College of Fisheries, responsible for teaching Extension Principles, Communication and Environmental Education. The nature of the training programmes at the college requires me to implement the programmes as required by the college policy. A curriculum, in the form of a document is provided for the two courses, and my duty is to develop schemes of work, lesson plans and teach the students according to what is contained in the curriculum documents. I therefore act as an expert in the two subjects. Grundy (1987) critiques this as a narrow view, in which a curriculum is seen only as a product. She sees this as a reflective of a technical knowledge interest (Habermas, 1972) (see section 2.7.5).

My interest in this particular study grew out of an ACE (EE) course assignment in 2003, where I conducted a small scale action research project to find out how outreach

programmes could be improved by drawing on indigenous knowledge. During this research, fishing communities complained that the extension programmes that the extension workers use do not or respond to the needs of the fishing communities (Kachilonda, 2003) (see appendix 7). During the action research, fishers argued that the decline of the Chambo fish stocks was due to the poor approach to fish conservation imposed by the Fisheries Department. Among other reasons, the fishing communities cited that the failure of the extension workers in the delivery of extension services was due to a lack of skills and knowledge. They noted that the fishing communities had more knowledge of the fishery than the extension workers who were being sent out to train them (Kachilonda, 2003). Kawagley and Barnhardt (1999) comment that it is important to start on educational process with what the learners and the communities know and are using every day.

Through my experience as a lecturer as well as a field worker, I realised that we dwell a lot on what is not applicable to the fishing communities because we base our training courses primarily on scientific knowledge of fishery, and very little thought is given to the fishing communities, who for generations have been fishing and have a wealth of knowledge of the fishery and the conditions influencing fishing. Listening to their stories during the action research, I realised that the fishing communities have rich and important knowledge on the Chambo fishery that, if properly utilised, would improve the curriculum and the training programmes at the college.

According to the Fisheries Policy on training, the Malawi College of Fisheries is required to have a curriculum that reflects the needs of the fishing communities and that involves them in fisheries conservation programmes, as one way of ensuring the legitimacy of the programmes (GoM, 2001, see section 2.6.1).

Among the reasons for the declining Chambo catches are the violation of the regulations, which includes fishing during closed seasons, fishing with illegal gear, illegal fishing and habitat destruction amongst other practices (see section 2.5). The fishing communities emphasise that these have become uncontrolled because they have been left out of the management programmes and that the government operates independently (see section 4.5). In conducting this study, I wanted to explore how the

fishing community's long-standing experience of the fishery could provide the opportunity for the college to benefit from their knowledge and through their involvement, facilitate the improvement of the curriculum and there orientation of the training programmes.

1.6. General structure and orientation of the thesis

In this thesis, I present the views of the fishing communities, business people and fisheries personnel on the existing curriculum at the Malawi College of Fisheries and what the fishing communities can contribute to the curriculum so that it reflects the needs and existing practices in Chambo conservation. The study was conducted in two areas in the South East Arm of Lake Malawi where Chambo fish used to be found in abundance. In order to generate data, and to establish a deliberation process amongst different stakeholders, three methods were used: interviews, focus group discussions and workshops (see section 3.4). Apart from the data generated from the three methods, I also undertook a critical review of literature to provide a broader perspective on curriculum theories and natural resource management issues and their interpretation (see chapter 2).

I discovered that what emerged from the data was related to the arguments in the literature and also some of the research studies that have been done on the relationship between the fishing communities and the government (see chapters 5 and 6). Considering the challenges we are experiencing in the Fisheries Department, I have focused much on Cornbleth (1990), who views curriculum as a contextualised social process and the interaction that takes place between the learners, educators and the environment surrounding them, and on Lotz (1999), who argues for curriculum deliberations as a process that facilitates greater contextual relevance in environmental education curricula and which reflects a social constructivist epistemology.

1.7. Overview of the study

Chapter one introduces the study. It outlines the context of the research and the research focus by introducing the research question and its goals. The chapter also

provides insights into my role at the college and the interests that I had in doing the research. It has also on provided insight into the general structure of the thesis by elaborating on the technical structuring of the thesis.

Chapter two of the thesis provides the context and history of the Chambo fishery in Lake Malawi. It explores the fisheries policy on training and the restoration of the Chambo fish by looking at previous research programmes and their implications for the conservation of Chambo. The chapter also outlines curriculum development at the Malawi College of Fisheries in relation to the fisheries policy on training. It finally discusses adult education, local knowledge and its implication for curriculum development, drawing attention to the epistemological basis of curriculum work amongst adult learners.

Chapter three discusses the methods used to investigate the local community contributions to the Malawi College of Fisheries curriculum. The chapter highlights my understanding of interpretive case study research and its relevance to this research question and the research goals. I indicate in the chapter that to develop the case study and to establish a deliberation process with the fishers, I used a variety of data generation techniques. It also outlines how the data was analysed. It provides insights into research ethics and also how I have evaluated the trustworthiness and validity of the research.

Chapter four describes local knowledge and views on the Malawi College of Fisheries curriculum. It looks at the preferred fish, the fishing methods used to catch the Chambo fish and their impact on the Chambo fishery. The chapter explores the fishing community's views on the role of regulations. It also investigates community involvement in the training programmes and the interaction between the fishing communities and the extension students. It further explores the importance of practical experience for the extension students. It finally outlines the possibilities of introducing fisheries courses and wildlife clubs in primary schools as a way of sharing Chambo conservation information with fishing communities along the lake shores.

Chapter five presents a discussion of the findings in the light of the views of curriculum theorists such as Cornbleth (1990) and Lotz (1999). The discussion in the chapter draws on findings from chapter four and by providing further insights into the findings from chapter four it provides a deeper level of analysis. This second layer of data analysis includes a review of the existing curriculum, and associated theories of curriculum development. It provides suggestions for a revised curriculum that takes into account the local knowledge contributions as well as the available scientific knowledge informing conservation of the Chambo fish and extension worker training.

Chapter six provides a concluding summary of the study. It outlines recommendations based on the findings as discussed in chapter five. These recommendations are made to the Fisheries Department through the Malawi College of Fisheries to inform a review of the college curriculum in order to draw on local knowledge and incorporate contributions in to the curriculum.

1.8. Conclusion

In this chapter, I have introduced the research context by providing a geographical orientation for the area of study, and I have outlined the orientation to the research questions and goals. I have explained why I was motivated to do the research, and I have explained my role at the college and the courses that I am involved in. I have provided some background to the existing curriculum at the Malawi College of Fisheries and its emphasis on technical knowledge. I have also have provided an outline of the thesis by narrating what is covered in each chapter.

The next chapter will provide the context and history of the Chambo fishery. It also discusses the curriculum, with a focus on adult education, participation and local knowledge.

CHAPTER 2
CONTEXT, HISTORY AND CURRICULUM

"... there is ample scope for broadly reshaping the existing educational curricula in Africa, to provide a more appropriate basis for development"
(W'Okoot-uma & Wrerko-Brobby, 1985:138).

2.1. Introduction

This chapter presents an overview of the Chambo fishery in Lake Malawi and its relationship to the training programme at Malawi College of Fisheries. The chapter starts with the national importance of the fish and its biology. It then looks at the status of Chambo fish and some of the factors that affect the fishery. It further outlines the government policy in general and provides an historical background to the training programme at Malawi College of Fisheries and its curriculum. It then focuses on policy and its influence on the curriculum both at national and institutional level. As background to informing a revision of the college curriculum, the chapter considers trends in adult education and curriculum development. It also considers participation and local knowledge as these relate to curriculum development and includes a consideration of the social constructivist epistemology that appears to underpin contemporary curriculum theories, such as those proposed by Cornbleth (1990); Grundy (1987) and Lotz (1999).

2.2. The national importance of fish

Fish in Malawi plays a very important role as a source of food, employment and income. It is the cheapest source of animal protein and contributes 60-70% of the total animal protein consumption (GoM, 1988). Previous studies have shown that almost 40% of the total protein intake in both the rural and urban diet was derived from fish prior to the collapse of the Chambo stocks (GoM, 2003). As a result of the declining fishery and the concomitant high rises in price, the Chambo fish is no longer available to most poor rural Malawians. Clinical trials conclusively show that children deprived of animal protein especially fish do not develop full mental capacity. This emphasises the importance of fish to the people both in rural and urban areas (GoM, 2003).

Fish also provide an important livelihood source for the rural poor, in particular lakeshore communities. Fishing provides direct and indirect employment to over 300,000 people living along the shores, who mostly depend on fish related businesses like fishing, fish processing and marketing (Banda *et al.*, 2003). The Chambo fish is the most favoured and valuable of all the fish species found in the lake and as a result it is in very high demand at the market. Hara (1993) confirms that the Chambo fish is the most valuable species as it sells at about three times the price of other fish species and that it is the most popular fish with customers. The Chambo fish stocks are exploited by the subsistence and small scale fishing activities, which are highly complex and which use a wide variety of fishing gear.

The importance of the fish to the nation is also reflected in the importance attributed to the lake, not only at national but also at international levels. Copes (1997), Lawson (1984) and Bland (1991, cited in Donda 1995) comments that fisheries have long been viewed as a vehicle to promote economic growth through their contribution to the Gross Domestic Product (GDP) and foreign earnings. In Malawi, fish contributes an estimated 4% of the gross domestic product (GDP). Lake Malawi has a very rich biodiversity, with over 800 different fish species and is regarded as one of the world's most important fresh water heritage sites as 14% of the global fresh-water biodiversity is found in Lake Malawi (Mdaihli & Donda 1991). Out of the 800 fish species, Chambo (*Oreochromis species*) forms the basis of very important commercial fisheries in both industry and small-scale artisanal fisheries, especially in the South East Arm, where this research is based.

2.3. The biology of the Chambo (*Oreochromis species*) fish

The Chambo fish comprises three closely related species of *tilapiine cichlid* namely *Oreochromis lidole*, *Oreochromis karongae* and *Oreochromis squamipipinnus,* all of which are endemic to Lake Malawi, i.e. they are found nowhere else in the world (Palsson *et al.,* 1999). All these species are primarily phytoplankton feeders (Konings, 1995). This is why they are predominantly found in the South East Arm of Lake Malawi where, because of its shallowness, there is an abundance of natural food for the fish. This provided the motivation for identifying the two research areas in this study, as

they are located in the South East Arm of Lake Malawi where people have been fishing the Chambo fish over the years.

2.3.1. Breeding behaviour of Chambo fish

The Chambo fish normally breeds in deep waters in collective nesting areas called leeks or arenas at a depth of 5 - 40 metres. They are maternal mouth brooders, thus females carry fertilised eggs and fry in their mouths until the young develop to a stage where exogenous feeding is possible. During this period, the females continue to protect the young ones and allow them to return to their mouths if they are threatened. During the fry-guard stage, females and young remain in shallow waters where they are vulnerable to beach seine net fishing (GoM/FAO/UNDP, 1993). The fry-guarding period lasts for several weeks until the fry have reached a large recommended size: *Oreochromis squamipinnus* 15mm, *Oreochromis karongae* 24mm and *Oreochromis lidole* 58mm (Lowe, 1952). The female fish incubates up to around 325 eggs of which only about 1% survives to adulthood, and generally only one batch of eggs is produced per female per year (Turner, 1996). The nursery grounds are typically inshore and include inlets in the lakeshores, mouths of streams, reedy as well as rocky shores.

The young Chambo lives in shallow waters at the edges of the lake, especially among the vegetation in pools or lagoons, separated from the main rivers. The two areas where this research is based have a number of flowing streams, which run down in to the lake, with a number of sites that are reedy and ideal for the Chambo juveniles. Chambo populations are generally localised, exhibiting limited migration patterns and can easily be fished out (Palsson *et al.*, 1999). In situations where fishing is not controlled, the fish stands the risk of being fished out. This is one of the reasons why the Department of Fisheries is looking at various options at different levels to make sure that Chambo stocks are conserved. The Chambo fish reaches maturity at about three years (Palsson *et al.,* 1999).

Figure 2.1. Matured Chambo Fish, source: Fisheries Department

2.3.2. Spawning season for Chambo fish

The spawning season for the Chambo species in area A, (south of Boadzulu Island) where the research is based, varies according to species. The *Oreochromis karongae's* peak spawning period is August to October, *Oreochromis squamipinnus* is January to February and *Oreochromis lidole* October to November (Turner and Mwanyama, 1992). The different spawning periods of the three species explains the importance of proper management strategies that require not only scientific information but also the fishing community's contributions and involvement in participatory educational processes, which could facilitate an understanding of the scientific information and a sharing of local knowledge. Due to increasing numbers of modified under-meshed fishing gear, the fish is usually caught before it reaches its recommended size. As the fish become scarce, the use of this illegal fishing gear becomes more common and there are high risks of catching the young fish, which might result in the complete depletion the entire Chambo fish stocks.

2.4. The status of the Chambo fish in Lake Malawi

In the early 1980s, government policy was to fully exploit the economic potential of the fish resources of Lake Malawi, including the Chambo, in order to enhance the nutritional status of the population. The annual total catch of Chambo fish has declined markedly from a record high of over 9,400 metric tones in 1985 to a low level of about 1,400 metric tones in 1999. In 1982 for example, Chambo contributed 49% of the total

fish landings for Lake Malawi, but by 1999 it only contributed 7% of the total catch (Banda *et al.,* 2003). In order to establish a suitable management strategy for the Chambo fishery, a research project was commissioned in the South East Arm of Lake Malawi, Lake Malombe and the Upper Shire River in 1982 (FAO, 1993). The production loss in the Chambo fishery led the Fisheries Department to engage in a number of consultative processes to come up with some management options on the status of the fishery in order to see: -

- What is broken?
- Why has it broken?
- What needs fixing?
- Where should action be focused to get the best return? (GoM, 2003:13).

As part of these consultative processes, the Department of Fisheries is initiating different programmes to try and find the means to restore the Chambo stock in Lake Malawi and Lake Malombe. This research aims to contributing to the above initiatives by looking at some of the strategies that could be used to improve the college curriculum so that skilled and competent extension workers can be produced who can efficiently work with the fishing communities in fish conservation in different areas along the lakes and rivers.

Among other causes of the decline of the Chambo fishery in the South East Arm of Lake Malawi are poor extension services and poor enforcement of management regulations, some of which are formulated on the basis of biological research carried out forty years ago (Van Zalinge *et al.,* 1991). The decline of the Chambo fish catches is a national concern and the Fisheries Department has been working on mitigating measures to protect what it calls "the important living gold from the lakes" (GoM, 2003:10). In a separate statement, the Fisheries Department notes that:

> Eating fish in Malawi means having Chambo on the plate and the name Chambo is almost synonymous to fish, as a result any decline in Chambo fishery is a cause of concern to the fisheries industry, policy makers, politicians and Malawians in general (GoM, 2003: 10).

In the process of looking at what has gone wrong in the fishery, the Fisheries Department has noted that it is also very important from the socio-ecological point of

view, to look at management interventions that are suitable to the context in which they are implemented (GoM, 2003). In the process of developing this research proposal, I developed a contextual profile on the status of fish in the South East Arm of Lake Malawi (Kachilonda, 2004). One of the interviewees pointed out that for the misunderstandings between the communities and the Fisheries Department to be sorted out, Trust must be built between the two and that this can only be achieved if people are able to work together. He also pointed to the lack of political influence as major setback affecting efforts to rebuild the stocks (Weyl, pers comm. 6/02/2004).

2.5. Factors affecting the Chambo Fishery

According to the Government of Malawi (GoM, 2003: 16-18) there are several factors that have affected the Chambo fishery in Lake Malawi and these are: -

- Over-fishing due to ever-increasing numbers of entrants into the fishery,
- Open access system where people are free to start any type of traditional fishery as long as he/she pays a licence fee to the government,
- Poverty, which results limited in economic opportunities along the lake shores leaving people highly dependent on the fishery for their livelihood,
- Illegal fishing where most of the fishing gear used on the lake is illegal,
- Habitat destruction, which includes the removal of submerged aquatic vegetation beds in shallow waters, exposing juvenile Chambo to predation and other fishing methods,
- Violation of the closed season, leading to intensive fishing during the breeding season. Due to concentration of Chambo when breeding, many Chambo fish have been caught while spawning,
- Violation of the protected areas as people fish in the designated protected areas like Lake Malawi National Park and Liwonde National Park, thereby reducing the protection of, and breeding opportunities for Chambo fish,
- Absence of clear property rights, which results in a 'tragedy of the commons' as no one person or group can be held responsible for the collective impact
- Inadequacy of the taxation system, which, through the fishing licence fee system provides inadequate resources for funding rehabilitation of the fishery (GoM 2003:17). Communities, however, argue that taxes paid in the form of

> fishing licence fees are utilised at national government level, and are not 'ploughed back' into improving the conditions of local community life through developmental projects and communities do not see the benefits of the taxes.

This reflects that there is a range of interacting factors affecting the Chambo fishery. These include socio-economic factors, migration of fishers, population pressure, and biophysical factors. These are discussed in more detail in the sections below.

2.5.1. Socio-economic factors

As indicated in section 2.2 above, the fisheries sector in Malawi plays a very important role in Malawian society. Despite the increased importance of the sector over the years, there have been few studies that have examined the role that socio-economic factors play in the sustainability of the fish stocks. Chambo remains one of the most valuable fish species in Lake Malawi (Donda, 1995, see section 2.5.1). However, the catches have kept declining especially in the South East Arm of Lake Malawi where a lot of fishing of the Chambo takes place. Most of the research that has been done in the area has been on the fish and Hara (2001) argues that the problem of the Chambo decline was not due to a lack of scientific knowledge. Hara (*ibid.*) notes that most of the research has been on the Chambo fish, and almost no research has been focussed on the people who depend on it for their livelihood. On the same point, Njaya (2001: 36) comments:

> It is important to consider fishing as well as other income generating activities that provide sources of livelihood for the communities around the lakes. Any project that promotes fisheries development should also take into consideration other general issues affecting the community e.g. economic empowerment for investing in other businesses so that during the recessions communities should be able to support their families.

Arguing the same point, Donda (1995) notes that the dominance of a biological orientation has been identified as one of past failures of fisheries management throughout the world. He says fisheries management is about people more than it is about fish and that to try to manage a resource without considering the people who harvest the resource is naïve (*ibid.*). Almost all the people living along the lake shores derive their livelihoods from the fishery and it is important to identify alternative options

to fishing as a way of getting them involved in other activities so that they are not entirely dependent on the fishery (*ibid.*).

2.5.2. Migration of fishers

Many people have moved from different areas of Malawi to places near the lakeshore to establish fishing businesses, and many decided to stay and farm when the catches of fish started to decline (Kachilonda, 2003). In the fishing business, fishers also migrate from one area to the other, searching for better fish catches. This becomes a problem when they move to areas that do not accept the type of fishing gear they are using. The enforcement of the regulations in this situation becomes expensive and impossible because the fishers do not stay in one place. A potential response to this would be empowering the local leaders and the people at particular landing sites to take responsibility for checking who is landing in the areas and whether they are complying with the regulations (Kachilonda, 2003).

Due to high levels of poverty in Malawi, with limited economic opportunities available elsewhere, crop failure and drought, more and more people go fishing, thereby adding to the pressure on the fish stocks. People are forced to damage the fish stocks to ensure their short term survival. As a result of having no alternatives to the fishery and the persistent low catches, they use illegal fishing gear to catch fish for their survival, regardless of the impact they are making on the resource. A survey that was carried out in 1999 in the South East Arm of Lake Malawi indicated that over 90% of the fishing gear that is used is illegal (Mdaihli & Donda 1999). In this case, there is a high risk of depleting not only the Chambo fish, but also the other fish stocks, because fishing gear is under meshed.

2.5.3. Population pressure impacting on the fishery

Fishing efforts increase as the number of people increase and as their options for alternative livelihoods decline. The Malawi population is growing at a high rate with a growth rate of 3.7% per annum and it is this growing population amongst other factors that is causing further pressure on the already declining fish stocks (GoM, 2000). The

low catches force people to fish with illegal gear and to ignore the regulations on closed seasons. Beck (1992) argues that when one is in a risk society, risks are unknown and there are unlimited consequences. People need to be convinced that the situation is out of hand and that it needs to be addressed. However, it may not be sufficient to look at population growth only to explain environmental degradation but also the economic situation of the rural population in terms of income earning activities and opportunities. Some of the social services such as education in family planning that are supposed to be offered to the rural communities are not sufficient, resulting in limited understanding of the effects of over-population on the available natural resources. The absence of these social services and lack of viable economic alternatives are all linked to macro economic issues such as debt servicing and structural adjustment, all of which combine to create the conditions for uncontrolled fishing, all of which put the Chambo fish stocks at risk (Donda, 1995).

2.5.4. Biophysical factors

The removal of the submerged aquatic vegetation beds in shallow waters and other vegetation along the shores exposes juvenile Chambo to predation and different fishing methods (GoM, 2003). This has been due to the use of destructive fishing gear that destroyed much of the aquatic vegetation that was present. This type of fishing has reduced the food base for fish and the refuge needed for the fry and juveniles. Degradation of the surrounding terrestrial environment has also increased soil erosion, which has led to siltation, which affects the breeding and spawning grounds in the lake (Banda *et al.*, 2003). Many people have opened land up for farming and landing beaches have been created resulting in the clearance of most of the wetland that used to have swamps and thick vegetation. As a result many of the breeding grounds and nurseries that were available for the Chambo have been cleared.

In an interview with one of the researchers during the development of the contextual profile, he pointed out that one of the major problems that has an effect on the Chambo fishery is the destruction of the environment along the lakeshores and also along the river-banks (Weyl, pers comm. 6/02/2004). He noted that apart from looking at the fish and fishery, it is important to study the catchments and people's livelihood

options, and obtain their full involvement in the overall management of the catchments of the lake on a larger scale.

Many farming activities that take place upland have effects on the fishery. The agricultural chemicals (e.g. fertilizers and pesticides) have resulted in chemical concentrations in the breeding areas, which have also affected the breeding patterns of the fish (Ribbink 2001). The development of lake shore hotels, resorts and cottages has also led to clearance of the beaches with many of the breeding grounds destroyed. Beck (1992) comments that the production of wealth is usually accompanied by some risks. In this case the risks of these agricultural chemicals and tourism developments have diverse impacts not only on the fishery, but also on the humans have depended on the fisheries over the years.

2.6. Government policy on the restoration of Chambo fish

The Malawi government's major goal is poverty reduction through sustainable development and economic growth. Due to the declining fish catches, the contribution of fish to total animal protein consumption has generally dropped. Of particular concern is the Chambo fishery, which has exhibited the single most significant decline (GoM, 2003). In the process of developing mitigating measures to protect the Chambo fish, the government of Malawi's report to the World Summit for Sustainable Development (WSSD) in Johannesburg in 2002 highlighted the decline of the Chambo fishery. It also noted the government's commitment to restore the Chambo fishery to its maximum sustainable yield (MSY) by 2015 (GoM, 2003). In the commitment, the government outlines things that need to be done in an attempt to restore the depleted Chambo fish stocks in line with the Millennium Development Goals and other regional and International Conventions. The importance of the Chambo fishery can be seen by the fact that the Chambo Restoration Strategy is a core part of Malawi's National Strategy for Sustainable Development (NSSD) and is anchored by commitments made at the 2002 World Summit for Sustainable Development (WSSD) (GoM, 2003).

Responding to the commitment made at the World Summit for Sustainable Development in Johannesburg, the government of Malawi, through the Fisheries Department, launched the "National Save the Chambo Campaign". This campaign

aims at mobilising all Malawians to take part in a programme for the sustainable use of the Chambo fish; attracting more foreign and domestic funding to restore the stocks to the pre-1990 levels, and also working towards achieving commitments made at WSSD to restore the depleted stocks by 2015 (GoM, 2003).

2.6.1. Participatory policy implementation

The new Fisheries Conservation and Management Act was reviewed in 2000 with the emphasis on community participation, resource ownership and empowerment of rural communities (GoM, 2000). According to Campbell and Townsley (1996), community participation is the active, meaningful and influential involvement of individuals or groups in an activity. According to the policy changes, the fishing communities or groups of fishers and all other people who are involved in the management of the fisheries resources ought to be engaged in the fisheries management process. In order to achieve this policy goal, the department aims to mobilise local communities to participate and play an active role in fisheries management through Beach Village Committees (BVCs) (GoM, 2001). As the policy emphasises community involvement, there is also need to investigate with the community members and fishers, some unanswered questions that still exist, like non-compliance with the regulations on the closed season and the persistent use of illegal gear that seems to continue to contribute to the decline of the fish stocks. Wilson *et al.* (1994) argues that if fisheries resource management is to succeed, fishers must support the management efforts. This research strives to incorporate the local community's knowledge into the Malawi College of Fisheries curriculum as one way of creating a sense of ownership of the college curriculum, and as a way of enhancing fishing community support for the fish conservation programme.

2.7 The Malawi College of Fisheries and Chambo conservation

The Malawi College of Fisheries was established in 1964 to offer training courses for fishing communities and fisheries personnel in fisheries management. Previously, the training programmes were focused on the exploitation of the fisheries resources because there were a few fishers with limited fishing gear (Kazembe, pers comm. 17/05/04). During the time when training programmes were focused on the exploitation

of the fish resources, the most important subjects taught at the college were fishing methods, post-harvest technology and others that looked at the management of fisheries products. As more and more people joined fishing, fish catches including that of Chambo started to decline. This facilitated a change in the training focus from resource exploitation to sustainable utilisation of fisheries, allowing the fish stocks to regenerate for future use.

The change in the training focus resulted in a review of the college curriculum in 1994 for which the World Bank, through the government, hired a consultant from Europe to review the curriculum (see section 2.7). The 1994 curriculum review involved limited consultation with the teaching staff, and the fishing communities (for whom the courses are designed) were not consulted at all. This essentially represents a top down approach to curriculum development, which limits the potential contributions of the resource users for deliberating on and co-defining their learning in context (see section 2.7 below).

As mentioned in section 1.2, the college runs a number of training courses. It runs Fisheries Management Certificate courses for 'O' or 'A' level students, who, after successful completion of the course, work as Fisheries Assistants both in the government and the private sector. It also runs in-service courses for the serving Fisheries Assistants, who, after one year of training, are upgraded to supervisory positions in the field. The college also conducts tailor-made courses at two levels. It conducts courses for user communities mostly for a period of one week in specified subject areas, depending on the needs of the learners. It also runs international courses for students who would like to be trained in specific area within Fisheries Management. The period for the latter varies from six months to one year, depending on the nature of the course.

The college is the main fisheries training facility for the Fisheries Department and besides degree courses offered at the University of Malawi, it is the only institution offering Fisheries Management training. It is also the only institution that has the potential for easy access to work closely with the fishing communities, due to its location along the lake shore and its close proximity to the fishers. Its curriculum and

programmes therefore have a key role to play in supporting policy and in responding to the conservation and sustainable development challenges outlined in section 2.5 above.

2.7.1. National Policy and the curriculum

As indicated in section 2.7.4 above, the National Fisheries Policy is meant to be aligned with the Malawi Development Policy, which aims at reducing poverty through rapid sustainable economic growth and improvement in income distribution (GoM, 2001). Under this broad policy, the fisheries sector provides employment to over 300,000 people and supports about 14% of the Malawi population, which resides along the lake shores (GoM, 2003). While providing jobs, the fisheries sector also aims to maximise the sustainable yield from the natural waters to improve the efficiency and sustainability of exploitation and the expansion of the existing and development of new aquatic resources.

The Malawi College of Fisheries policy stresses the importance of training as a method to develop and maintain skills in the public and private sector of the fishing industry (GoM, 2001). In order to develop and maintain appropriate skills as stipulated in the National Fisheries Policy above, the college is supposed to involve all the stakeholders in the development of its curriculum, so that it reflects the needs of the fishing communities, as stated in the guiding principle of the policy:

> ... in the past, major emphasis was placed on the use of enforcement to police fisheries regulation, the low effectiveness and high costs of this strategy in fisheries management has created the need for an extension [and by implication training] approach, which fosters greater community participation in fisheries management. The need to strengthen the extension service in order to implement an effective participatory management of the fisheries has been emphasised (GoM, 2001:6).

Some of the objectives of the policy are:

- To develop and provide a range of *demand driven* courses for fishers, co-management and aquaculture to support user communities (objective 5.1, my emphasis);

- To implement courses on *actual issues* in fisheries, aquaculture and environment to develop and strengthen capacity in development and management (strategy 5.3.4, my emphasis);
- To develop and maintain high quality training standards (objective 5.4) (GoM, 2001: 17-18).

Another goal of the Fisheries Department is to support local communities and the private sector in the development and management of capture fisheries (GoM, 2001: 5). As indicated in the policy (*ibid.*), this goal can be achieved through mobilising communities to actively participate in the management of fisheries resources. It is in line with the above requirement that the Malawi College of Fisheries should have a curriculum that will respond to the needs of the fishing communities; that will foster participation in fisheries management; and that will provide high quality education and training. To explore the implications of the above policy imperatives for the Malawi College of Fisheries curriculum further, I turn now to a discussion of trends in adult education and curriculum, which may inform a revision of the curriculum.

2.8 Policy implications and trends in adult education

As mentioned above, the Malawi College of Fisheries offers a range of courses to different adult learners. It is therefore important to this study to explore some of the recent trends in adult learning. As mentioned in section 1.5, the nature of the training courses carried out at MCF is that they are primarily expert-driven, with the lecturers required to impart knowledge to the learners with minimum interaction between the learners and the lecturers or among learners themselves. Lotz (1999:54) notes that, in recent years, there have been a number of shifts in thinking about adult education. A key shift is away from instrumentalist approaches (as evident in the current MCF curriculum), where pre-existing bodies of knowledge are 'taught' or transferred to learners. The shift is towards models of learning that involve "co-operative meaning making amongst adult learners in the context of real-life situations" (*ibid.*). This model of learning is underpinned by social constructivist, experiential and participatory approaches.

Knowles (1983, in Edwards et al, 1996): commenting on ideas that inform andragogy (the science of adult education), notes that adults have a different self concept from

children: adults have experience to draw on in learning situations: adult learning is determined by social roles and that adult learners tend to be problem focussed. Andragogy, or the science of adult learning, has developed different theories that influence adult education. For example:

- adults should be participants in planning the learning processes,
- adults should take mutual responsibility for the teaching-learning transaction,
- experiential learning techniques are more appropriate in adult learning,
- adult learning should have a problem-centred orientation and
- the individual adult's problems should be the departure point for curriculum activities (*ibid*: in Lotz, 1999:55).

Jansen and van der Veen (1992), however, note that we should not simplistically adopt theories of andragogy, as these can often result in simplistic assumptions and a techniquing of adult learning. They, drawing on the theory of Beck's (1992) risk society argue for more reflexive approaches to adult education, which are also participatory, experiential and problem-centred. Knowles (1996: 83) argues further that education is not the transmission of what is not known, but is rather a process of lifelong discovery of what is not known. Engaging fishing communities would facilitate the process of getting and knowing what knowledge they already have and what needs to be done to improve on what they already know. Apart from the biological assessment that has been done to understand the causes of the decline of Chambo, there is little socio-economic information known about what might have contributed to this decline beyond broader knowledge of the impact of poverty on natural resource use.

Recently, the Malawian government has indicated that there is a need to know how management interventions could be more effectively implemented in the Malawi context, by looking at socially acceptable management interventions, e.g. closed seasons, gear limitations, access limitations and sanctuary areas (GoM, 2000, see section 2.6.1). This signals a shift from a "Chambo-centred" approach to a more "people-centred" approach to fisheries management. A more people-centred approach will require deliberation with the resource users, to establish why people behave in particular ways to establish processes of change through education. Lotz (1999) comments that adult learners have the potential to apply their knowledge of a situation, in collaboration and in dialogue with others, so as to seek collective solutions to shared

problems. Given the context of the fisheries issues in Malawi, it would seem important to consider curriculum approaches that foster this kind of interaction and problem solving. A review of trends in adult education provide some insight into how courses can be structured in ways that may be relevant and useful while at the same time responding to the needs of the learners or user communities through people's involvement in curriculum development. This has implications for the Malawi College of Fisheries curriculum.

2.9 Policy, curriculum purpose and curriculum development trends

2.9.1 Curriculum purpose

As noted above, the Malawi College of Fisheries is required to implement its programmes in line with the National Fisheries Policy objectives. The policy emphasises the importance of having a curriculum that reflects the interests of the people, through their active participation. Change in national policy and context (as described in section 2.9 above) influence the *purpose* of the curriculum. Da Costa *et al.* (1994) indicate that curriculum intention or purpose is an important dimension of curriculum work. They note that:

> One thinks most easily about curriculum as if it were simply a programme of content, and this is useful, for it is hard to imagine curriculum planning if it does not involve careful attention to matters of content. We need, however, to think about curriculum far more widely than that. In the first place, curriculum is not just about content: it is also about *intention* and about *process.* So, in addition to the question regarding the content of the curriculum, we have to ask the additional question, what are the purposes or intentions of the curriculum and what are the procedures through which the curriculum is to be mediated ...? *(ibid.:* 31).

Within the new policy context in Malawi, it would seem that the purpose of the MCF curriculum is changing, from knowledge transfer involving primarily scientific information about fish, and fisheries management, to a curriculum that is aimed at fostering participation and deliberation, with the aim of strengthening participatory resource management.

With this change in purpose, it would be important to consider trends in curriculum planning that support more participatory, deliberative approaches. To understand different approaches to curriculum, Grundy (1987) draws on Habermas' (1972) theory of knowledge interests to explain different kinds of curriculum. Habermas's theory of knowledge interests explains how people think about knowledge, and how knowledge is organised in society. Habermas proposed three different knowledge interests in society, which Grundy (1987) interprets as different approaches to curriculum:

- **A technical knowledge interest**: The technical interest is primarily focussed on *controlling* and managing the environment through empirical analytical approaches. According to Grundy (1987:12), this technical interest give rise to forms of action that are governed by technical rules based upon empirical knowledge. She argues further, that objectives based approaches to curriculum are informed by a technical cognitive interest. This approach characterises the existing MCF curriculum.

- **A practical knowledge interest**: The practical interest is primarily focussed on *understanding* the environment, which is grounded in people's interest in living as part of the world (not in competition with the environment) through interpretive approaches. According to Grundy (1987:14), interactive forms of action result from this knowledge interest and key concepts associated with the practical knowledge interest are understanding and interaction. She argues further that curriculum design is regarded as a process "through which pupils and teachers interact in order to make meaning of the world (*ibid.*)". She notes further that Stenhouse's process model of curriculum has a practical knowledge interest, and quotes Stenhouse as saying that "A process model of curriculum development rests on teacher judgement, rather than teacher directions" (Stenhouse, 1975:96).

- **An emancipatory knowledge interest**: The emancipatory interest is primarily focussed on *emancipation,* which involves independence from external structural forces. An emancipatory interest is often linked to notions of justice and equality. According to Grundy (1987:18), the forms of action that result from an emancipatory interest are critical, and are focussed on empowerment

and the abilities of individuals and groups to take control of their own lives and take action in autonomous and responsible ways. An emancipatory curriculum works towards facilitating freedom from 'false consciousnesses. It helps people to identify forces of domination in society, and involves learners and educators in taking action to address problems in society. It involves action and self-reflection. This approach has been widely adopted in adult education in developing countries, following the work of Paolo Freire (1972), who proposed that adults are able to emancipate themselves from domination in society. This trend has become known as 'radical adult education' (Elias & Merriam, 1995).

Cornbleth (1990) draws on the latter approach to knowledge when she notes that technical approaches to curriculum have very little impact on classroom practice. She describes curriculum as an ongoing social process, which comprises interactions between learners and educators and other stakeholders.

The Malawian Fisheries Policy, with its emphasis on participation in the process of curriculum development, responsiveness to local user needs and actions to respond to fisheries management issues would seem to favour an emancipatory approach to curriculum. However, the policy does not recommend critical engagement with fisheries management issues or government policy, so it may well reflect more of a practical interest, rather than an emancipatory interest. The purpose of the new Malawi College of Fisheries curriculum would therefore seem to be located in a practical interest.

2.9.2 Curriculum development trends

Influenced by practical and emancipatory knowledge interests, curriculum development processes have changed over time from objectives based approaches to deliberative approaches.

Objectives based approaches to curriculum development (Tyler, 1949) are criticised by Cornbleth (1990) as being technocratic. She notes that in technocratic approaches to curriculum development, "the development task is typically undertaken by curriculum specialists outside the schools or by teacher committees guided by specialists. The

curriculum thus produced is then disseminated for implementation,..." (*ibid.*: 14). This approach also suggests that curriculum is composed of separate components, namely objectives, subject matter and materials, that can be constructed separately in a linear sequence. The assumption is that these together then make a coherent curriculum. Stenhouse (1975) sees this as a 'means-ends' model focussed on pre-defining student behaviour.

Stenhouse (1975:2), however, notes that "curriculum is not the intention or prescription, but what happens in real situations". He introduces a stronger process approach to curriculum development. Like Stenhouse, Grundy (1987) views a curriculum as constructed within an actual learning situation where learning is a social process and knowledge is socially constructed. Cornbleth (1990) sees a curriculum as an ongoing contextualised social process comprised of interactions between teachers, students' knowledge and milieu. Looking at curriculum in context, Cornbleth (1990) refers to curriculum knowledge as knowledge that is made available to students through opportunities in which they construct, reconstruct or analyse knowledge. She distinguishes between structural and socio-cultural dimensions of curriculum. According to Cornbleth (*ibid.*), the structures influencing a curriculum shape participants' experiences of learning. She indicates that the structures include legislation and political systems and the way national education systems are run and organised. This gives rise to particular forms of curriculum and curriculum documents, e.g. the existing MCF syllabus. In referring to the socio-cultural dimensions of curriculum, she considers the "extra-systemic demographic, social, political, and economic conditions, traditions and ideologies, and events that influence curriculum and curriculum change" (*ibid.*: 31). This indicates that curriculum is influenced by official discourses, as well as cultural and socio-ecological factors in context.

Participatory, contextualised approaches to curriculum development have received attention in southern African environmental education processes, as approaches have been sought that enable communities to participate in their learning in ways that allow critical contextual dialogue and action at a local level (Lotz 1999). For example, the importance of involving user communities in curriculum review and development is noted by Janse van Rensburg and Le Roux (1998), who indicate that if the course [the Rhodes/Gold Fields course] is to benefit participants/learners in their specific work

situations, it will need to draw heavily on participant's experiences and that the tutors and learners will have to negotiate the curriculum development. Work in the southern African region on participatory, deliberative approaches to curriculum development was synthesised by Lotz (1999). She describes a process of curriculum deliberation which is participatory. According to Lotz (1999), deliberative curricula in environmental education are characterised by the following interacting key curriculum features: responsiveness, flexible course structure, participation, praxis and assessment as learning, each of which is discussed briefly below:

- **Responsiveness**: This curriculum feature considers how curriculum processes can be responsive amongst learners in socio-ecological contexts. In the case of this study, this would require consideration of how the curriculum would be responsive to the needs of the fishing communities and the government in a socio-ecological context that is characterised by loss of biodiversity (specifically the Chambo fish) and poverty as explained in 2.5.1 above.

- **Flexible course structure**: This curriculum feature considers how an open curriculum structure and flexibility can facilitate curriculum deliberations. In the case of this study, this would require consideration of how the curriculum can be re-structured to allow for deliberations amongst stakeholders. This would appear to require some flexibility to accommodate local knowledge.

- **Participation**: This curriculum feature considers how curriculum processes can enable participation. This involves a shift away from 'preaching' to sharing knowledge, encouraging active participation, drawing on participants' experiences and finding ways of allowing participants to contribute to the course. It also involves different kinds of participation at different levels in the course. In the case of this study, this would require a consideration of how the fishing communities could participate in the college curriculum, and how learners in this case (extension officers), could participate in the courses in different ways.

- **Praxis**: This curriculum feature considers how curriculum processes facilitate informed critical action. This encourages learners to ask 'why' questions about

what they are doing, and how they are doing things. It involves learners in taking action in real situations, and in thinking critically about what they are doing. In the case of this study, this would require a consideration of how learners (the extension officers) can be more involved in taking action in real situations, and it will require a consideration of how critical thinking can be encouraged.

- **Assessment as learning**: This curriculum feature considers how assignments and assessments can enhance learning. This presents a different perspective on assessment to the normal 'exam driven' curriculum assessment. It involves learners in negotiating the assessment frameworks and in self-and-peer assessments. In the context of this study, this would require a consideration of how current assessment practices are seen in the MCF curriculum.

This review of curriculum development trends has provided some background that could inform a review of the MCF curriculum, if it is to be consistent with the new fisheries policies. Based on these perspectives, it would seem that the MCF curriculum needs to be reviewed to include the involvement of people within context to reflect the actual needs and interest of people who will directly and indirectly benefit from it. In order to respond to the institutional policy requirements that emphasise the need to develop appropriate knowledge, skills and attitudes amongst fisheries personnel and the user communities, there appears to be a real need for this research project, which has the potential to provide guidance and advice to the lecturers and management at the institutional level, to revise the existing MCF curriculum to facilitate an up-to-date, relevant curriculum.

2.10 Local knowledge and curriculum development

With its emphasis on participation and user needs, the fisheries policy also points to the importance of drawing on indigenous fisheries knowledge in participatory fisheries management (GoM, 2001:8). As noted in section 1.5, I undertook a previous study to consider the role of indigenous knowledge in the MCF curriculum (Kachilonda, 2003). During this study, I realised that there are different perceptions of what indigenous knowledge is, and that it is often associated with the past. I did not, therefore want to

limit the study in that way, so I chose to work with the idea of local knowledge, which consists of knowledge relevant to both past and present. It also encompasses indigenous knowledge, but this was not the key focus of this study. I drew on Kinyanjui (1995: 2) who argues:

> ...any serious environmental education has to be rooted in local communities, bring with it local participation, knowledge, orientation and be geared towards dealing with concrete realities of daily life.

Emphasising the importance of people's participation [and the role of local knowledge] in curricula, Berger and Luckman (1966) argue that knowledge is socially constructed and that it is through deliberation and sharing of knowledge, skills and experiences that people learn from each other. Hara (2001) also argues that one of the reasons that have been advanced for the failure of the fisheries management regime in Mangochi is the lack of user involvement in the management processes.

Based on the review of the MCF curriculum purpose outlined in section 2.9 above, it would seem important to establish a curriculum development process that allows the knowledge of the fishers and fishing community to be considered in curriculum development. This requires research to establish what local knowledge can be brought into curriculum deliberations. In my previous research, I established that local people (the fishing communities) are as concerned about the decline of the fish stocks and their conservation as the scientists, who have been generating information on the Chambo fish, yet their knowledge is not considered in the curriculum (Kachilonda, 2003). Bassey (1999) argues that people perceive, and so construe, the world in ways which are often similar, but not necessarily the same and that there can be different understandings of what is real. The knowledge, skills and experiences that people have acquired over the years may offer positive contributions and at times bring new solutions to the existing problems in the fishing industry.

A consideration of local knowledge in curriculum deliberations assumes a social constructivist epistemology. This epistemology underpins the work of Grundy (1987), Cornbleth (1990) and Lotz (1999), as outlined above. They all argue for the contributions of learners to curriculum. Popkewitz (1984) comments that knowledge is

essentially value-based and historically grounded within specific contexts, indicating that these contributions are socially situated in socio-ecological and socio-cultural contexts. O'Donoghue (2001) comments that courses should take cognisance of the different systems of knowing and social values with regard to environmental issues and risks (mobilising learner's prior knowledge), foster critical engagement with local and contextual issues and encourage action taking. The benefit of involving both learners and educators in participatory curriculum development processes in which they co-construct meaning, is also cited by Mukute (1997), who notes that the approach marks a shift from structure to process, putting people first and also emphasises the notion of being both learners and educators.

Explaining a social constructivist epistemology in more depth, Janse van Rensburg (2001:12) notes that a social constructivist epistemology assumes that "meaning and knowledge are socially constructed by human beings in interaction with one another and with the cultural understanding into which they become socialised". She notes that a social constructivist epistemology is associated with the following assumptions:

- *Our understandings of the world come not from objective reality, but from other people; both past and present* .... The language we use informs the way we think, by providing the categories and concepts that give us the frameworks for meaning making.
- *Our modes of description, explanation and representation are derived from relationships* .... This assumption explains the emphasis on processes rather than structures.
- *As we describe, explain or otherwise represent, so we fashion our future* ... our traditions and institutions depend on a continuous process of generating [new] meaning together ... this opens possibilities for transformation.
- *Reflection on our forms of understanding are critical to our future well-being* ... [this] insists that we look critically at our taken-for-granted ways of understanding the world... this requires not merely reflection on our situation or action, but also 'reflexivity' – reflection on the position from which we reflect! *(ibid.*: 13-14, emphasis original).

In the context of this study, this means a careful look at the categories and concepts that have framed the MCF curriculum development process to date. It also means consideration of the processes associated with curriculum development rather than just the structures, and establishing ways of generating new meanings that may open possibilities for curriculum transformation. It also requires reflection and being critical.

Learners in the current curriculum are expected to work and fulfil requirements as stipulated in the course outline, through course work and examinations with limited or no practical sessions. Lotz (1999) notes that when developing new courses, it is important to know and to take account of the nature of the context, and to be clear about the specific needs of the participants. She further notes that through these processes, learning (and curriculum development) becomes an open-ended process of deliberation and reflexive review around contexts of action. This involves engaging local ways of knowing (local knowledge).

It is through considering local knowledge and the above mentioned epistemology that the college may be able to develop a more people-centred, socially relevant curriculum and open the space for inter-epistemological dialogue (where learners, educators and community members share their different ways of knowing) during the development and implementation of the curriculum. Beck (1992), in considering reflexive learning processes as a way of responding to risk, e.g. decline of the Chambo fishery notes the importance of inter-epistemological dialogue, i.e. considering different ways of knowing. This is an important consideration in curriculum deliberation processes as neither scientific knowledge, nor local knowledge is likely to provide an adequate solution to the risk (of the declining fish stocks). It is the combination of these different ways of knowing, that is, according to Beck (1992), more useful in responding to risk.

This provides a justification for the way in which this research aims to establish a deliberation process with the fishing communities, through interaction with the fishing communities and drawing on the rich knowledge, skills and experiences they have acquired over years of fishing, to make a contribution to the college curriculum.

2.11 Concluding summary

In this chapter, I have outlined the importance of fish in Malawi looking at the role it plays in society. I also have looked at the impact of by the decline of the Chambo fish on people at a local level. I have also focused on the importance of Lake Malawi and

its biodiversity in relation to the socio-economic standards and livelihoods of people who depend on the fishery for their survival.

I provided a brief outline of the biology of the Chambo fish by looking at its species composition, its breeding patterns and its life cycles in order to provide insight into the management options. I have also briefly reviewed the status of Chambo fish and here more focus has been on the declining numbers of the fish over the years. I have also gone further to describe some of the government initiatives that are trying to improve the declining catches, and I have described a number of solutions that have been proposed by the government, key amongst these being policy change and the immanent review of the MCF curriculum to become more people-centred. Some of the factors influencing the decline of the Chambo have been outlined and, it has been noted that most of the influencing factors have traditionally focussed on the biological aspects and have left out the social aspects of the problems.

The biophysical impact of the fishery is also another area that I have examined, bearing in mind that the removal of the submerged aquatic vegetation beds in shallow waters has an impact in the conservation of Chambo fish. I have also provided insights into government policy and its recent commitment to the conservation of Chambo, as stipulated in its report during the World Summit for Sustainable Development 2000 in Johannesburg. The commitment of the government to restore the Chambo fishery by 2015 empowers the Department of Fisheries to look into various management options for the conservation of the Chambo fish. I outlined the implications of these policies for curriculum development at the Malawi College of Fisheries.

I have drawn on trends in adult education to provide some perspective on the existing MCF curriculum, and I have critically considered the change in purpose of the curriculum, in relation to the new policy requirements, I identified that there appears to be a shift in purpose from a technical knowledge interest to a practical knowledge interest, even though it would, at first appearance, seem that the new fisheries policy supports an emancipatory knowledge interest. I have considered the policy implications and this change in purpose in relation to curriculum theory, drawing on the work of Stenhouse (1975); Grundy (1987); Cornbleth (1990) and Lotz (1999). I have

argued that contemporary curriculum theory is underpinned by a social constructivist epistemology, which has implications for a curriculum review.

I finally considered the local knowledge in curriculum development, and have argued for a process-based approach to curriculum change, which involves deliberations with fishers and fishing communities. This further develops the argument for a social constructivist approach to curriculum development, and this epistemology is considered in the light of Beck's (1992) theory of risk, in which he argues for inter-epistemological dialogue, which draws on different ways of knowing (scientific and local knowledge) in addressing risks such as the decline of the Chambo fish.

In doing this, I have reviewed recent literature on adult education, and curriculum development and I have highlighted the potential of deliberative, participatory approaches to curriculum development for improving the Malawi College of Fisheries curriculum, which I consider in more depth in chapters 5 and 6, in relation to the data generated and reported in chapter 4.

The next chapter outlines my research methods in more detail, and describes how I, through the use of qualitative methods in two sites, established the early stages of a curriculum deliberation process with fishing communities in the two research sites referred to in section 1.1. As noted in section 1.4, this was one of the aims of the study.

CHAPTER 3

RESEARCH METHODOLOGY

"... a significant dimension of this experience was deepening Understanding of the notion that we are "all learners and educators".
(Janse van Rensburg & Le Roux, 1998:32).

3.1. Introduction

This chapter outlines the methods used to generate data related to my research question. As already stated in a previous chapter (see section 1.3), my research question is 'what contribution can local communities make to the existing Fisheries Management curriculum of the Malawi College of Fisheries? I indicated that the research would focus on Chambo fish, as this is the most favoured fish species in Lake Malawi. In order to answer the above question, I had three research goals to consider (see chapter 1). These goals all influenced the research design decisions made to guide the research process. This chapter describes the research design, and also reflects on the research process.

3.2. Research orientation

The orientation of this case study is interpretive. Terre-Blanche and Kelly (2002) define interpretive research as a method that describes and interprets people's feelings and experiences in human terms rather than through quantification and measurement. This research is aimed at drawing on the knowledge, skills and experiences of fishing communities to improve the current fisheries curriculum. As indicated by Janse van Rensburg (2001), interpretive research provides well-grounded and rich information in the context of a study. Emphasising the same point, Terre-Blanche and Durrheim (1999) comment that interpretive research strives to make sense of feelings, experiences and social situations by studying their natural settings.

Considering the amount of knowledge and experience fishing communities have gained over years of fishing and the implication behind the understanding and

interpretation of the fishing community's subjective knowledge, skills and experiences (see chapter 2), I worked with fishers, fish crew members, fish traders and local leaders in two specific research areas in the South East Arm of Lake Malawi (see figure 1.0). Terre-Blanche and Durrheim (2000) argue that people's subjective experiences are real and should be taken seriously (ontology), and that we can understand other people's experiences by interacting with them and listening to what they know (epistemology) (see section 2.8). They continue to say that a useful aphorism associated with interpretive research is to "make the strange familiar and the familiar strange" (*ibid.*: 139).

Due to the low levels of interaction that currently exist between the Malawi College of Fisheries and the fishing communities (see section 4.5), there is a lot of useful local information with which that lecturers and students are not familiar which, if properly explored and interpreted through community consultation, has the potential to improve the training programmes and later the performance of the extension workers (see section 4.3). This is the focus (hypothesis) of this research project. As it is designed as a case study, it will help me to gain detailed and in depth insight into the fishing communities knowledge during the research process. Yin (1994:13) defines a case study in terms of research process. The process of enquiry with the fishing communities and the literature review will provide opportunities to come up with recommendations to inform a review of the curriculum, which is due to take place in 2005.

3.3. Description of the research method

The research is an interpretive case study focusing on the Chambo fish. As noted in chapters1 and 2, Chambo fish is the most favoured fish species in Lake Malawi because it has a high market value and people also favour its palatability. In chapter 2, I described how the Chambo catches have been declining over the years despite government efforts through awareness-raising programmes and regulations. I have used the Chambo fishery as a case study because among other things, the Fisheries Department, through the Malawi College of Fisheries, aims at enhancing human capacity through training in order to sustainably manage and utilise the Chambo fishery through training (see section 2.7.4).

Yin (1994) defines case study research as an empirical inquiry that investigates a contemporary phenomenon within its real-life context, especially when the phenomenon and content are not clear. In the case of this research, there has been a plethora of biological research on the Chambo fish in order to establish management options, and many awareness programmes have been established to make people aware of the importance of conserving the fish, but the problem remains unsolved. Stake (1995) argues that we study a case that is of special interest and we look for details on the case being examined. It is my concern that, following the plethora of biological research on the Chambo fish, attention should be given to the socio-economic factors that also influence the fishery of Chambo (see section 2.5.1). This case study seeks to explore some of the details associated with this interest.

This case study is trying to understand and make meaning of local communities' existing knowledge, skills and experiences to foster a shift from the fish-centred approaches to Chambo management to a more people-centred approach (see section 2.8). Yin (1994) notes that as a research strategy, case study is used in many situations to contribute to our knowledge of individual, group, organisational, social, political and related phenomenon. This case study therefore aims to provide information on the real situation that is evident on the ground, to enable course designers, curriculum developers and implementers to involve local communities when planning, developing and implementing educational programmes at the MCF.

To develop the case study, I used a variety of data generation techniques, which I discuss in the next section. Besides generating data from this study, these techniques also enabled me to establish an early deliberation process with the fishing communities, which can be taken further in future.

3.4. Data generation

In order to get the required information to answer my research question and to develop the case study, I used three sources of data generation: -

- Face to face semi-structured interviews,

- Focus group discussions, and
- Workshops.

Apart from the three sources mentioned above, I have also kept a research journal where any information related to the research was recorded. I worked with fishing communities and extension officers as my critical friends throughout the research. Preliminary data analysis was undertaken soon after data from the different data sources was generated and the emerging issues were taken into account in the next data generation process. This facilitated a process of progressive focusing during the research.

3.4.1. Interviews

The first research process started with interviews with a wide range of fishing community members in the two research areas (see section 1.2). According to Cohen and Manion (2000), an interview is intersubjective; it allows participants be interviewers or interviewees and to discuss their interpretations of the world in which they live. On the same note, Wellington (2000) comments that interviews allow a researcher to investigate and prompt things that we cannot observe and that through interviews we can probe an interviewee's thoughts, values prejudices, perceptions, views, feelings and perspectives. In order to get in-depth information especially of the fishing community's local knowledge, I developed a semi-structured interview schedule (see appendix 1) and used a face-to-face approach, which Terre-Blanche and Durrheim (1999) refer to as a process of getting to know each other.

Figure 3.1. Face-to-face interview with a fishing community member

I developed a sample of the interview schedule and I piloted it in the two research areas in order to establish people's responses and make amendments where necessary to ensure adequate data generation relating to my research. Together with the extension officers (who were my critical friends), we discussed the information collected in relation to my research question. As a team, we re-worked the interview schedule by adding information and we also removed some where necessary, to make the interview schedules clearer. Tuckman (1978) indicates that interviews provide access to what is inside the person's head, and this makes it possible to measure what a person knows, what a person dislikes and what a person thinks. From the discussion with the extension officers, we realised that some of the unclear answers in the pilot study were the result of unclear questions, and that all the interviewees were doing was responding to the questions put forward to them.

I interviewed twenty-seven (27) fishing community members, fifteen from Malindi (area 2.2) and twelve from Kela-Makawa (area 2.1) (see AMI appendix 4). The interviewees were randomly selected in order to capture a wide range of views from fishers, grocery owners, fish traders and local leaders about Chambo conservation. I worked with the extension officers from the two research sites, and they served as my critical friends throughout the research process. All the interview respondents were notified in advance of the interviews, to allow them time for preparation. A preliminary data analysis soon after the interviews indicated a number of emerging issues from the interviews (see AMI appendix 4). The emerging issues were then taken further to inform the data generation process (the focus group), allowing for a process of progressive focussing and deepening in the data generation process.

3.4.2. Focus group discussions

Focus group discussions followed immediately after the interviews. Lewis (1992) indicates that a group of six or seven is the optimum size for focus group discussion. In this research, I worked with seven fishing community members (six men and one woman). The number of men out-numbered those of women because men are more active in the fishing business. Women are mainly involved in fish trading. I developed guiding questions, drawing on the issues that emerged from the interviews to assist and guide the discussions, but this did not necessarily influence the discussions

because most of the time the discussions were followed by questions to explore the issues arising in more depth. Terre-Blanche and Durrheim (2002) say triangulation of data entails collecting material in as many different ways and from as many diverse sources as possible. The focus group discussions helped me to triangulate the data from the interviews and extend it further for discussions where a number of issues were discussed for further clarification.

According to Terre-Blanche and Durrheim (1999), when one works with a group of people, one gains access to understanding differences between people, who might previously have been thought of as a homogeneous group. Patton (2001) also comments that in a focus group interview, participants get to hear each other's responses and to make additional comments beyond their own original responses as they hear what others say. In the course of discussions, the participants enriched their knowledge and understanding from the views and experiences fellow members.

The focus group was composed of the following: gear owners, crewmembers, fish traders and local leaders. The combination of members with different work experiences was intended to allow them to bring in different experiences and to deliberate a wide range of issues and in the process generate rich and useful information of value to the research. Patton (2000) comments that in a focus group discussion, it is not important for the people to agree or disagree, but rather to get high quality data of different views in a social context. Although members had different understandings of the issues that emerged from the interviews, their discussions and the sharing of knowledge and experiences facilitated a better understanding of the emerging issues (see chapter 4). As focus group members were critically discussing the emerging issues from the interviews, new issues emerged and these were drawn on in the next data generation process, for further discussions and verification (see AMF appendix 5). All the discussions were recorded and transcribed to enable me extend and draw on the focus group data in to the workshops. Throughout the research I kept noting some of the more important information in my research journal.

3.4.3. Workshop deliberations

The information generated from the interviews and the focus group discussions was taken further in two workshops (one per area) as a way of triangulating, validating and deepening the findings. In order to ensure continuity in the research process, most of the fishing communities who were involved in the interviews and focus group discussions were involved in the workshop deliberations. Fleming (1997) defines a workshop as a participatory learning meeting that empowers people through active sharing of knowledge, skills and experiences. The workshop started with a brief outline of the research process from the beginning and a summary of what came out of the interviews and the focus group discussions. Workshop participants got a good understanding of the research focus and they were given further opportunity to make contributions based on emerging themes and issues arising in interviews and focus group discussions. Patton (1999) recommends that the researcher go back to the communities with summaries or main themes from the research to make sure that whatever has been captured is a true picture of what transpired during the research process.

Just like in the focus group discussions, I prepared some guiding questions to lead the workshop deliberations, but these were not meant to dictate the workshop deliberations. There were twelve fishing community members at the first workshop and eight at the second workshop. They were selected from different work backgrounds and among them were fishers, local leaders, fish traders and BVC members. Moon (2001) comments that a workshop is a way of turning experiences into knowledge. Members who had different work experiences within the fisheries sector worked in groups to deliberate the questions that were provided. They spent a lot of time discussing the information emerging from the interviews and the focus group discussions. As members were discussing in various groups, each group captured their discussions on flip charts for presentation to share with members from the other groups. Patton (1999) notes that information sharing can be done in a series of report back meetings held with different stakeholder groups so that interpretations are shared and further information or clarifications sought.

Figure 4.1. Group discussions during the workshops

Workshop participants critically deliberated the data in relation to what is actually happening in the areas and the needs of the fishing communities. As they discussed the issues, many of the inputs confirmed what had already been said in the interviews and focus group discussions. There were, however, also some new perspectives, which deepened the emerging insight. Campbell and Fishe (1995) confirm that triangulation is a powerful way of demonstrating concurrent validity, particularly in qualitative research. The use of the three sources of data generation confirmed that the themes or categories from the research were valid and were representative of the fishing community's views and knowledge.

3.5. Data analysis

Harberman and Miles (1994) say that in an interpretive research process involving a lot of qualitative data, the first step will be data immersion. As mentioned above, the first layer of data analysis took place soon after every data generation activity to enable me to take the emerging issues further to the next stage. When I finished conducting the interviews, I realised I had a lot of data to manage before the next data generation process. Harberman and Miles (1994) expresses the importance of coding data from interview responses, partially as a way of reducing what is typically called data

overload. After all the interviews, I went through the completed interview schedules over and over again to map out the themes that were related to my research question. I then used colour coding to isolate the emerging issues so that issues of the same type bear the same colour code.

The coding started in the interview schedule analysis was used to analyse the focus group and workshop data. What emerged from the coding process is that a category or theme that emerged from the interview data, would also for example be seen in the other data sources because it had the same colour code (see AMI; AMF; AMW). As mentioned above, some new codes and themes were developed during the focus group and workshops analysis. Data coding in this way reduced the enormous data load that I had generated. After coding, I started analysing the data following the categories that emerged. As more and more data analysis was done the issues became clearer because issues were being refined through the analysis of the three data sources. The table below illustrates the first layer of data analysis.

Table 1.1. A summary of categories and sub-categories

Category	**Sub category**
Chambo a preference fish	• Fetches high price at the market • Delicious fish • Attracts more trade than any other fish species • Breeds very quickly
Fishers to provide lacking skills and knowledge to the college	• To provide the lacking historical background • Can provide skills and experiences gained over years of fishing • Can teach students good fishing methods • Students need to know the importance of closed season • Fishers, students and lectures should work together
Teach more on fishing methods	• Use of light is destructive for the Chambo • Trawl net fishing is destructive for Chambo fishery • Modified gear is destructive to Chambo fishery • Students should research the current fishing methods • Emphasis on the impact of increased fishing efforts
Emphasis on regulations	• Students need to know the importance of observing regulations • The students need to know the role of

	government on regulations • Students need to know the importance of enforcing regulations • The decline of the Chambo fishery is due to lack of security • People used to respect local regulations and as a result had a lot of Chambo fish • Regulations need to be revised
Students need more practicals in the field	• Students need more time to learn from fishers • Students should be sent to work with fishing communities in the field • Students should be encouraged to practice what they will be doing • Students should be left in the field for three months • Students should get indigenous knowledge from fishers • Students and lecturers should be visiting fishers for more knowledge
Impact of extension services	• Extension workers provide outdated information to fishers • Extension workers are not familiar with their work • Extension workers need more practical skills • Extension workers need more technical support • Extension service need to change its approach
Introduction of fisheries courses at primary school level	• There is a need for fisheries courses to start at primary school level
Introduction of wildlife clubs in schools along lakeshore	• The college should introduce of wildlife clubs in schools and involve young boys & girls

3.6. Ethics in the research process

In this research, I worked with two groups of people, the fishing communities from the two research areas and the fisheries extension officers working in the areas (as described in section 3.4). Wellington (2000) argues that participants in a research study have the right to be informed about the aim, purpose, findings and their potential consequences. Before the start of the research, I organised a briefing meeting for the extension officers working in the research area and the District Fisheries Officer, explaining the aim and purpose of the research and why the two areas were chosen in the district. I then requested to work with the extension officers as my critical friends

throughout my research process so that they could follow what was taking place, and so that we could all learn from the research and wherever possible make contributions.

The extension officers organised the community meetings with the local institutions (Beach Village Committees) and together we briefed them about the research, its aim, purpose and the community's role in the research and we requested their involvement and support for the research process. The research process took account of the three ethical values in social research: respect for persons, respect for truth and respect for democratic values (Bassey 1995). Apart from the first briefing those who were involved in the process of data generation were given feedback through the process of member checking. Both the fishing communities and the extension officers, soon after every data generation activity, were asked to comment or add to the findings before moving to the next stage of data generation. All this was done to respect the people with who I worked on the research.

Terre-Blanche and Durrheim (2002) argue that in a research process, there should be freedom for research participants to withdraw from the research at any time. For this research, we agreed with the research participants on their free entry and exit depending on the individual's interest. All the research participants were told to be free to give information or not and that they should not feel obliged to do so. They were also assured of having freedom to express their ideas or views about the fishery, the Malawi College of Fisheries and to criticised ideas raised in the research process where they felt it necessary. The research participants were assured that the information they would provide for the research would be treated confidentially and that no name would be revealed or mentioned. No research participants were promised anything in return for their participation in the research process, but were gratefully thanked. With all this in place, the participants' democratic values were respected.

3.7. Validity and trustworthiness

In order to ensure a good quality case study, I have used multiple sources of information. The use of one to one interviews, focus group discussions and workshops is aimed at triangulating the data and ensuring that the findings are valid and trustworthy (see AMI; AMF; AMW in appendix 4, 5, 6). Using the three data sources, I

managed to get rich data and was able to provide a thick description of the findings (Maxwell 1996:95 see chapter 4). All the raw data collected from the two research areas has been carefully colour-coded and the emerging issues have been clearly mapped out from the data (see appendix 4, 5, 6). The categories from the data cut across all the data generated by the three methods, confirming the validity and trustworthiness of the categories in the research. In order to ensure accurate information from the research participants, I, together with my critical friends, repeatedly checked members before proceeding to the next data generation process and this allowed the fishing communities to add to or change the data (Lather, 1986).

3.8. Reflection on the use of the research techniques

The face-to-face interviews covered a wide range of issues and the personal involvement in the interviewing process gave me the opportunity to learn from their long experiences of fishing and fish conservation. The piloting of the interview schedules with the extension officers from the research areas, helped to clarify and focus the interview questions. The focus group discussions also brought many new insights, which had not been explored in the interviews. After the structured questions, the group members were asked to raise some of the areas they thought were important to discuss in relation to the research focus. This was the most interesting part, because members were able to raise issues that I had never thought of, like the introduction of fisheries courses in primary schools and the introduction of wildlife clubs to assist in the dissemination of information on fish conservation to a wider audience. However, a few members of the group dominated the discussions; especially the local leaders and at times the other members expected them to give more information on the issues that emerged from the discussions. This indicates how local policies can influence research results.

The workshops allowed more open discussions because most of the members were those previously involved in the research process and this allowed for continuity in the deliberation process. In all the workshops, the participants worked in groups of four and the groups were composed of participants with different work backgrounds, which provided rich information. However, I feel they would have discussed more if they had been given more time because after the allocated time was up, members requested for

more time, but even after the additional time, some members were still discussing the issues.

These three strategies, used in combination through a progressive focussing approach, enabled me to establish a process for the MCF curriculum deliberations in the areas. It thus provides a potentially useful methodology for facilitating curriculum deliberations in a community context. It should be noted, however that this is a resource-intensive and time-consuming process and that it needs to be carefully planned.

3.9. Concluding summary

In this chapter, I have provided an outline of the research design decisions that informed the research process. I have given an overview of the various research methods used to generate the required data to answer the research question.

I started the chapter by providing an orientation to the study, which is an interpretive case study and motivated the use of this orientation in this situation. I also provided a brief outline of the data-generating techniques to be used and provided reasons why the techniques are appropriate to this research. I explained how, in each data generation process, I undertook preliminary data analysis to inform the next data generation process. I therefore described how I analysed data, starting from the data coding to the actual data analysis, following and adapting the themes or categories that emerged from the raw data. Research ethics have also been considered in more detail by considering the respect for persons, respect for truth and also respect for democratic values. Finally I have looked at the validity and trustworthiness of the research process by reflecting on how the research was conducted.

In the next chapter, I share the main findings of the research. These reflect the local knowledge of the fishing communities, as well as their views on the MCF curriculum.

CHAPTER 4

LOCAL KNOWLEDGE AND VIEWS ON THE MALAWI COLLEGE OF FISHERIES CURRICULUM

"The overlooking and marginalising of indigenous wisdom in local ways of knowing and doing things is not only a thing of the past..."
(O'Donoghue & Neluvhalani, 2002: 125)

4.1. Introduction

This chapter presents findings from the fishing communities and shares their local knowledge and views on the Malawi College of Fisheries curriculum. It starts by narrating the fishing community's preferred fish, the current fishing methods and the role of regulations in fish conservation and how these relate to the college curriculum. It also provides the fishing community's views on their involvement in the training programmes at the college. The chapter finally outlines some of the options fishing communities have identified to improve conservation education, by suggesting primary school education programmes, with the Malawi College of Fisheries taking a leading role.

4.2. The most preferred fish species in the two project areas

The starting point of the research was focused on getting a general picture of people's preferred fish so that I could relate it to other information throughout the research process. Understanding people's preferred fish choice helped me to better understand the socio-economic importance of the fish for the livelihood of local people. Through this process, I was able to get a better understanding of what people's views and intentions are regarding the conservation of the Chambo fish.

During the interviews, most of the respondents indicated that they prefer Chambo fish. They mentioned that the Chambo fish is an important resource for various businesses

and other uses, including catching, buying, selling and consumption in their homes. Most of the interviewees indicated that they prefer Chambo because it fetches a high price at the market (see AMI appendix 4). However, some of the interviewees indicated that they prefer other fish species to Chambo. Two of the people said they prefer Utaka *(Copadichromis species)* to the other species (MI1; MI3), while one person said that he prefers Catfish *(Clarrid gariepinus)* to the other fish species (MI2). The fish preferences expressed in the interviews were similar to those expressed in the focus group discussions where all seven people said that their preference fish is Chambo (see AMF appendix 5). As in the interviews, respondents gave various reasons why they prefer the Chambo fish. Most of the respondents said they prefer Chambo fish because it attracts more trade than any other fish and has a high market value and attracts more customers than any other fish species (FGP1; FGP3). One said that he preferred Chambo fish because it provides enough and delicious food at home (FGP3).

The discussions during the two workshops provided similar information to the interviews and focus group discussions. They all confirmed that Chambo is the most preferred fish in the lake. Workshop discussions also pointed out that even in the past the Chambo fishery was the most dominant type of fishery and that people were using seine nets, gill nets and traps to catch it (see AMW appendix 6). One of the group members commented that in the past people experienced high Chambo catches because there were fewer types of fishing gear like the seine nets and gill nets and that they had specific times for fishing. He went on to say that fishing was normally done within accessible areas that are within easy reach, unlike these days when people go further away and travel long distances for better catches (WAG1). This comment confirmed what one of the interviewees said. He noted that the fish catches for Chambo and other fish species have declined recently because there are more, and different types of fishing gear being used, compared to years back when fishing nets were owned by a few people only (MI8). Commenting on the same point, participants at one of the workshops said that because there were fewer types of fishing gear, people were able to catch 80 – 85 crates of Chambo per a day (one crate weighs 25 kgs), unlike these days when people return from fishing with a few fish and sometimes nothing (WBG2).

Commenting on the people who indicated that they prefer the other fish species, one of the members in the focus group discussion pointed out that people have resorted to the other fish because it is currently difficult to get Chambo (FGP3). This same comment was made by the one who indicated that he preferred Utaka (*Copadichromis species*) during the interviews where he said that the change in his preference was due to the shortage and high cost of Chambo fish (MI3). In his comment, he pointed out that Chambo is difficult to get because it is scarce or, if found, it is too expensive for the ordinary person to buy. The data that I generated through the three methods (interviews, focus group discussions and workshops) confirms that people prefer Chambo to any other fish (AMI; AMF; AMW). Those who indicated the other species as preference noted this was because Chambo is not commonly found or, if found, it is too expensive to buy (MI3).

4.3. Fishing methods and the management of the Chambo fish

The investigation into fishing methods was aimed at informing the Malawi College of Fisheries curriculum, as this is a key area normally covered in the curriculum. All the people I interviewed commented that the fishing methods that are currently used are contributing greatly to the decline of the Chambo fish (see AMI appendix 4). Some of the people pointed out that, due to the shortage of Chambo and other fish species, most of the fishers keep modifying their fishing gear to enable them to catch a few more, as many are dependent on the fish for their survival. One of the interviewees commented that most of the modified fishing gear targets Chambo and that, if these fishing methods are not checked, the ability of the Chambo fish to regenerate may be reduced (MI6). On the same point, one of the community members, during the focus group discussion, noted that if people were given proper advice, they would be motivated and would decide to go for the other fish species and leave the Chambo fish to regenerate (FGP1). The issue of providing proper advice to fishers was raised in the focus group discussion when it was said that students lack practical skills and are therefore not able to give proper advice to the fishers (see section 4.7).

When discussing the importance of an understanding of fishing methods amongst the students, interviewees expressed concern about the lack of knowledge of fishing methods that extension workers display, when working with the fishers. One of the

interviewees in the focus group said that most of the extension workers do not know of some of the fishing gear that the fishers use and said that it is important for the college to emphasise the fishing methods and more, the impacts they have on the fishery (FGP1). All the members of the focus group expressed concern over the increasing number of new fishing methods that are currently emerging, due to the modification of fishing gear and pointed out that this is a key cause of the negative impact on the fishery.

Three people in the focus group cited light fishing as one of the destructive fishing methods and noted that its main target is Chambo (see AMF appendix 5). A similar concern was raised by the other interviewees, who commented that light fishing is destructive to the Chambo fishery. They added that the catches would only improve if light fishing is stopped (see AMI appendix 4). As focus group participants were discussing the impacts caused by light fishing, one of the members (FGP2) commented:

> Light fishing is the most destructive fishing method because we see a lot of light during the night and fish have nowhere to hide. We need to take some measures on light fishing and the college can also help to find out how light fishing affects Chambo fishery.

The concern raised about light fishing was also of general concern to all the participants in the two workshops (see AMW appendix 6). Presenting their discussions on behalf of the group one of the participants in the workshops said that one of the fishing methods that caused a rapid decrease in the Chambo catches soon after it's the introduction, was light fishing (WAG1).

One of the focus group members expressed the need to investigate how light affects the fish and its environment and again highlighted the possibility of involving the students in researching the impact of light fishing on the Chambo fishery (and the other fish species) (FGP2). A similar comment was also raised during the interviews by one of the respondents who suggested that the students at the college could be involved in researching the impact of light fishing on the Chambo fishery as one way of encouraging them to interact with the fishers (MI3).

On the same point, one of the members in the focus group commented that from evidence of the decline of the fish catches since the introduction of light fishing, it is evident that light fishing is destructive and that, if left unchecked, the Chambo stocks will never regenerate and he/she emphasized the need for the students to know the process people have gone through and why things are the way they are now, indicating the need for historical knowledge. He went on to say that the problem is that many students do not come from the lakeside communities and may not know the problems involved which supported, a point that was raised in the second workshop that most of those who are not from the lakeside might not have the full history of the fishery (FGP4) (see section 4.5). Stressing the importance of exploring and teaching more about fishing methods, one the interviewees requested that the college emphasise fishing methods and show the students those methods that are destructive to the fish stocks to help them teach fishers in the field (MI8).

The other fishing method that people said they are concerned about is trawl net fishing. This is one of the commercial fishing methods, which operates by dragging a net either at the bottom of the lake or in mid-water, using engines that produce more than 40 horsepower. Six of the interviewees said that the introduction of trawl nets has contributed to the decline of Chambo and the other fish species because a decrease in the catches was noticed soon after its introduction (see AMI appendix 4). People also raised a similar concern during the focus group discussions where three of them said that the trawl nets are a destructive fishing practice, especially when they are dragged along the shores where most of the juvenile fish are found (see AMF appendix 5). One of the people commented that trawl nets scoop both the matured and the juvenile fish and when the net is dragged along the bottom of the lake; it also destroys breeding grounds for Chambo and other fish species (FGP3).

Commenting on what needs to be done with the students, one of the focus group respondents said that it is important that students are taught the dangers of using trawl nets and other fishing gear that is destructive to the fish stocks. When the idea of trawl net fishing was introduced in the two workshops, all the participants expressed the need to check its operation. They also recommended that, just as is in the case of other fishing gear, trawl netting should be given a closed season during the breeding period for the Chambo fish (see AMW appendix 6). Commenting on the effect of the

trawl nets on the fish catches, participants from one of the workshops confirmed the interviewee's point that the decrease in fish catches was noticed soon after the introduction of trawl nets in the fishery (WAG2).

One of the interviewees pointed out that apart from light fishing and trawl nets there are many different types of fishing gear used on the lake because of the open access system where everybody is allowed to fish, as long as he/she is able to pay a license fee to the government (MI1). In a related argument, one of the interviewees in the focus group discussion commented that the problem of the increase in fishing gear and fishers operating on the lake is one of the causes of fish depletion. He continued to say that this is because there is no limit on how much one should catch in a given period (FGP1). Commenting further on the same point, another member of the focus group stressed that if the number of people fishing was controlled and the amount of fish caught monitored, the catches would improve because the amount of fish being harvested would be more controlled (FGP5). One of the interviewees commented that if the students are to give proper advice to the fishers, they need to know these fishing methods and they also need to have a good picture of how much fish is harvested using the different fishing methods (KI4). Many of the focus group members commented that since fishing methods keep on changing as people modify their fishing gear, it would be important that the students also have more general knowledge on fishing methods in order to be able to give proper advice to the fishers with whom they will be working (see AMF appendix 5).

Based on the three sources of data, all the respondents expressed the need to have a good understanding of fishing methods, and particularly those that will assist in sustaining the fish stocks in the lake. Through citing their concerns regarding light fishing, fishing by trawl nets, ongoing modification of fishing gear and also increases in the number of fishers, respondents emphasized that the students need to have a better understanding of how these different methods operate and their impact on the fishery. One of the interviewees commented that when the students realize that the fishers know more than them, they feel out of place and do not enjoy their work any more (MI6). This comment stresses what was said in the focus group discussion on the importance of involving the students in field activities, as sometimes when students are sent to the field they do not have any idea of what they are supposed to do because

they have not been adequately exposed to field work (see section 4.6). The workshops confirmed the perspectives gained in the interviews and focus group discussions, particularly on the dangers of the different fishing methods. The workshops also emphasised the importance of high quality knowledge about the issues to facilitate more effective fieldwork.

4.4. Fishing regulations and the conservation of Chambo

Most of the people who were contacted during the research process (during interviews, focus group discussions and workshops) were concerned with a general failure to follow the fishing regulations. All the interviewees pointed out that most of the fishers use illegal fishing gear and that they do not observe the closed seasons (see AMI appendix 4). One of the respondents commented that the fish stocks are already depleted and if the use of illegal gear remains unchecked, the remaining stocks will be depleted further (KI6). Commenting on the same point raised in the interviews, three respondents in the focus group commented that most of the current fishing practices in Lake Malawi are illegal and that there is need to act on the situation before things get worse (see AMF appendix 5).

One of the respondents pointed out that the students are the ones who have the responsibility to educate the fishing communities, especially those who do not understand the importance of good fishing practices, and that they should therefore have a good understanding of the regulations (FGP4). He went on to say that the students need to have a very good picture of the importance of the regulations to the fishery and the implications of illegal fishing on the conservation and management of the fish stocks. A similar concern was also expressed by two interviewees who commented that the regulations need to be clear and to be understood by the students because if they cannot understand them, they will experience problems in working with fishers in the field (KI10; MI13). Commenting on the same point, one of them said that it may not be enough for the students to know the regulations only, but also to know how to translate them and link them with what the fishers are currently doing, for it to make sense to the fishers they will be working with (MI13).

Similarly, workshop participants commented that if the students are able to understand and interpret the regulations, it might be easier for them to work with communities because they will be able to interpret and explain the regulations to the fishers (WAG1). One of the members in the same group commented that the students are need to be well prepared to meet the challenges out in the field because there are a lot of fishers who have been in the fishing industry for a long time, and may not be prepared to listen to their advice on the importance of using good fishing methods, and complying to the relevant regulations.

Workshops participants also expressed concern over the large number of fishers who are currently fishing illegally. Presenting their discussions, workshop participants noted that the decline of the fish stocks (especially the Chambo fish) has been mainly due to lack of security and enforcement of regulations by the government (see AMW appendix 6). The above concern was also expressed by one of the members during the focus group discussion (FGP5) who commented:

> I think it is the Fisheries Office that does not have security. The offices are keen to formulate regulations, but never take an effort to enforce them; as a result people never take them seriously.

Commenting on the importance of following up on the regulations, two of the interviewees pointed out that it is not enough to formulate regulations, but it is also necessary to ensure that the regulations are implemented and followed up and this needs both the government's and people's commitment (KI4; KI9). A further comment on the same point was made during the workshops when one of the groups said that putting adequate security in place would enable people to realize the importance of regulations and this will force the people to follow them (WAG1). As people continued to discuss the importance of the regulations, one of the people in the focus group commented that the most important thing to remember in the management of the fishery is to make sure that fishers understand the importance of following the regulations. He went on to say that if this aspect is neglected then it would be difficult to manage the fish stocks (FGP6).

Most of the interviewees remarked that the students need to be conversant with the regulations to make sure that they give proper advice to the fishers with whom they will

be working. One of the interviewees commented that the students need to be taught a brief history of how people used to respect regulations, which were set by their local leaders, a practice that has managed to sustain the fish stocks to the present generation (MI2). One of workshop groups said that the challenges that face the students related to the regulations are enormous, and that it is important that the students are clear on the regulations because most of the fishers are currently operating illegally (WBG1). Most of the respondents remarked that the regulations need to be aligned with changing fishing methods as a way of monitoring their operations and as a way of stopping illegal gear. Workshop participants requested the Fisheries Department to revise the regulations so that they provide checks and balances on the newly designed fishing gear, which is destructive to the Chambo fishery (WBG1). A similar concern was raised by one member in the focus group, who commented that there are more illegal nets operating than legal ones and that a mechanism needs to be put in place to control these operations (FGP1). A point was also raised on the impact of current fishing methods by a member of the focus group, who also noted that the current fishing methods need to be monitored (see section 4.3).

From the above, the importance of understanding and following the regulations in fish conservation was emphasised by most respondents. They also emphasized the importance of teaching and exposing the students to the importance of regulations and the implications of illegal practices. Most of the respondents pointed out that if the students are to give proper advice to the fishing communities, then they should have a good understanding of the regulations to enhance that fishers also understand the implications of illegal practices.

4.5. Fisher's involvement in the college programmes

Many of the respondents expressed their willingness to get involved with some of the college programmes, especially to provide and share skills and knowledge with the students. Most interviewees commented that for the students to have a better understanding of the fishing methods, regulations and whatever is involved in the fishing communities, they must be exposed to what the fishers are doing (see section 4.3 & 4.4). Many of the respondents commented that the students could develop a

better understanding of the conservation of Chambo fish and the problems in the fishery if they are provided with some historical background (see AMI appendix 4). One of the interviewees commented that a lot of things have changed over the years and the students need to know and understand the process people have gone through and why things are the way they are now (MI8). Commenting on the same point, one of the focus group members expressed concern over the detachment of the fishing communities from the college, a gap that has affected the working relationship between the fishers and the extension workers (FGP1). Some of the interviewees commented that most of the extension staff that comes to work in the area is from other areas away from the lake and they consequently have little knowledge about the fishery and its history. They went on to say that they need to know this history, for them to be able to work meaningfully with the fishing communities and made an assurance that they can provide the historical background of the Chambo fisheries (see AMI appendix 4). One of interviewees commented that it is a lack of historical knowledge about the fishery that causes the extension officers to be out of place and unsure of what to advise the fishers (MI12).

Discussing the knowledge gap between the fishers and the extension workers further, members of the focus group discussion remarked that because of long periods of fishing experience, fishers have gained many skills and much experience that they can share with the students (see AMF appendix 5). One of them (FGP1) commented:

> You have book information about the fishery, but you may have limited information relating to our practices. If you want the students to have good information on the fishery of Chambo and the other species, then you need to consult the fishers who have been in the fishery for a long time.

The importance of the fisher's skills and knowledge was also commented on during the interviews where people acknowledged that fishers have acquired skills and experiences over the years of intensive fishing and that these experiences are important for the students to know and understand (see AMI appendix 4). Confirming the same ideas, workshop participants all supported the idea of involving the fishers in some of the college programmes (see AMW appendix 6). As people were making their group presentations, they argued that fishers have the experience that books may not provide, but which are nevertheless important to fish conservation in Lake Malawi (see

AMW appendix 6). Commenting on the same point, one of the workshop participants pointed out that the students and the lecturers can benefit from some of the information that fishers have, which can contribute positively to the conservation of the fish stocks (WAG3). Presenting on behalf of the other group members one of the workshop participants (WBG1) commented:

> Some of you do not come from this area. Do you know the history of Chambo and if you don't know what do you teach the student?

A comment of a similar nature was also made during the focus group discussions where members said that for the students to know what fishing methods were there before, and the changes that have taken place in terms of increased fishing gear, and the resulting decrease in fish catches, students needed a proper grasp of history (see AMF appendix 5). One of the interviewees argued that the students need information that will enable them to give better advice to fishers on the management of the fish stocks and that the fishers can provide some of the information (KI7). As the point was probed in more depth during the focus group discussions, one of the members commented that the knowledge about better fishing methods and the importance of the regulations and the closed season for the students depends on how much the college and the fishers interact (FGP1).

The idea of exposing students to relevant information was also raised during the interviews when one of the respondents said that it is important to expose the students to the fishers who are using different technologies so that they learn about new things, which they are likely to encounter in the field (MI1). A similar point was also raised at one of the workshops where people commented on the importance of the students, lecturers and the communities working together, indicating that in addition to student learning, it enables them to get to know and get used to each other (WAG1; WAG3). As was noted earlier on (see section 4.5), one of the workshop group members commented that when the students are sent to the field to start working, they feel isolated because they are not used to the fishers and sometimes they have no knowledge of what is happening on the ground (WAG3).

From the remarks and contributions that people gave on their potential involvement in some of the college programmes, it was evident that the fishing communities have the capacity and are willing to provide some of the skills and knowledge that may be lacking at the college. Most of them also commented that apart from the provision of absent skills and knowledge, the interaction between the fishers and the college will enable them to get used to the students and this will enable them to understand each other better. People confirmed their involvement and requested the college to make the necessary contacts through the existing Beach Village Committees in the areas.

4.6. Students' practical experiences in the field

Most of the interviewees were concerned with the performance of some of the students from the college when sent into the field. As was pointed out in the previous section, students lack exposure to the fishers in the field (see section 4.5). A similar concern was also expressed during the interviews. One of the interviewees commented that the students require more field experience as a way of preparing for improved fieldwork (MI15). Most of the interviewees remarked that apart from the theory work, the students need to practice what they will be involved with in the field. Focus group members pointed out that lack of exposure to the field is one of the major things that are limiting the required delivery of extension services in the field. Nothing on the importance of sending the students to the field, a member of the focus group (FGP5) commented:

> I think what needs to be done is that before the students are sent to the field, they must actually be told what they are expected to do in the field and also what they would expect the fishers to do. The problem is that some of the students come without knowing what they are supposed to do.

Commenting on the same point, two focus group members said that the students need more time to be with the fishers in various areas to be familiar with the fishing activities so that they see for themselves the areas that need more input (FGP2; FGP3). When the idea was taken further during the workshops, all the participants expressed the need to give the students field experience as one way of building their skills and confidence (see section 4.5). A further point on the need for students' attachments in the field, one interviewee said that when the students are sent into the field, they get

exposed to the real life situation because they get involved in what they will actually be doing (MI15). One of the members in the focus group commented that it would be better for the students to be sent to the field for a period of three months so that they can get a wide coverage and understanding of the activities in which fishers are involved (FGP2). Adding to what the other member had said, two members commented that students should be attached to the field for three months in order for them to cover a wide area along the lakeshores, because different areas have different ways of doing things (FGP2; FGP3). One of the participants in the first workshop (WAG3) reported:

> Students should be given chances to go and practice what they will be doing after their course just like what teachers who are at the teachers' college do. This could assist teachers and the new extension assistants to know each other before they get fully involved in fieldwork.

Another workshop participant reported that the knowledge that the students could be gaining from the fishers might also be important to the teachers in the college (WAG3). One of the groups during the workshops commented on the need for the students to access and understand the indigenous knowledge that the fishing communities have and work with them to come up with some recommended strategies on fish conservation (WBG2). Most of the members in the two workshops commented on the importance of students and lecturers visiting fishers as one way of knowing what they are doing and also improving the interaction between the fishers and the college (see AMW appendix 6).

Interviews, focus group discussions and the workshops all emphasized the importance of exposing the students to field activities so that they can learn a number of things that may not be covered at the college. This is also necessary to allow them to practice whatever is covered in theory at the college, i.e. to enhance praxis. This point had come up often in the previous discussions (see section 4.5). The importance of interaction between the fishers and the college was emphasized, to facilitate a sharing of knowledge and skills. All the interviews, focus group discussions and workshops emphasized the importance of letting the students get used to what they will be doing. This was seen as an important way of building confidence and competence in their future roles in the field.

4.7. The impact of extension services on the conservation of the Chambo fish

Interviewees had many different views on the government services and commitment to the conservation of Chambo fish. Some of the interviewees said that the extension services work more frequently with the Beach Village Committees in advising people about fish conservation (see AMI appendix 4). One of the interviewees commented that they work hand in hand with the extension staff in organizing meetings to let other people know about fish conservation and continued to say that those who are fishing illegally do it deliberately (KI6). On the contrary, another group of interviewees commented that the government services through the extension officers do not put enough effort into fish conservation (see AMI appendix 4). Some of the respondents said that the presence in the extension officers in the field does not influence any changes on the conservation of the fish stocks (KI4; KI11; KI12).

Unlike in the interviews where some of the people were positive and some negative about the extension services, all the people in the focus group discussions and the two workshops expressed dissatisfaction with the government services (see AMF & AMW). Commenting on the type of information that is provided by the extension staff, some of the people in the focus group pointed out that most of the information that the extension staff use does not reflect what is currently taking place in the field and that most of it is outdated (FGP1; FGP3). These remarks agree with what interviewees noted when they indicated that due to the declining fish catches fishers keep on modifying their fishing gear and that the extension service messages need to be updated regularly (see section 4.3). Focus group discussions were also concerned with the familiarity of the students with some of the practical issues in the field. A similar concern was also raised in one of the workshops where members complained that the extension staffs are sometimes not sure of themselves due to lack of technical skills and support (FGP2; FGP4, WBG3). Emphasising the same point, members from the second workshop pointed out that the extension services need more technical support for them to discharge their duties properly (WBG1). This concern agrees with the view of one interviewee that the extension staff need to be exposed more to the field so that they are more aware of and have more ideas of what people are currently doing (see section 4.6). During the interviews, one interviewee stressed the need to concentrate on the things that people are currently doing so that interventions that are

introduced make sense to the people and that these will have an impact on the existing programmes through a better understanding of the impacts of the particular practices on the fishery (KI11).

Commenting further on the impact that the extension workers have on the Chambo fish conservation programmes, one of the interviewees commented that the extension workers need practical skills, so that they can give proper advice. They noted that the extension workers could gain skills from interactions with the fishers (MI4). A similar point was raised by one of the focus group members, when he noted that the students would benefit from the fisher's knowledge if there was more interaction (see section 4.5). One of the workshop participants requested the government to provide more technical support to the extension services, so that people could have a better understanding and take part in the conservation of the fish stocks.

The remarks and comments that people provided on the impact of the extension services showed that the extension service needs to put more effort into its programmes and interact more with the communities. It was also pointed out that as things keep on changing, there is also need for the approaches and methods of the extension service to change so that the services respond to the current situation. The college was therefore requested to update its training programmes to enable students to perform more effectively in the field.

4.8. Introduction of fisheries courses in primary schools

One of the issues that came out of the focus group discussions and the workshops that were not explored in the interviews was the introduction of fisheries courses in primary schools. One of the members in the focus group (FGP3) talked of the possibility of introducing fisheries courses and commented:

> I have been a teacher myself for so many years. In Agriculture there is a subject starting from primary school to the higher learning, in Health, there are subjects on health education. Why can't we have fisheries as a subject at primary school where pupils will learn things on fish conservation?

All the members agreed with the idea and one of the members commented that young boys and girls would start learning about fish conservation at a very young age and that the parents would gain some information from the children (FGP3). Another focus group member commented that besides taking the information home, the young boys and girls will grow up with conservation ideas and may end up being responsible citizens in future, as they are the future fishers in the area (FGP5). One of the workshop groups pointed out that just like in the other departments it would be important to introduce a fisheries subject and that this would help to improve fisheries education amongst people (WBG1). Confirming the point, workshop members expressed the need to consult relevant people so that boys and girls could start learning about fish conservation at an early stage.

4.8.1. Introduction of wildlife clubs in schools

While people were discussing the importance of extending knowledge of the issues amongst different people as a way of reaching more people, one of the members in the focus group talked of the possibility of giving presentations and introducing wildlife clubs in primary schools (FGP3). As indicated earlier, the extension services are not seen to be effective (see section 4.7), and respondents suggested that the wildlife clubs would reach young boys and girls in schools who would spread information amongst other people in the communities. Commenting on the issue, the focus group member (FGP3) suggested:

> ....but you could also find means of maybe visiting schools that are along the shores of the lake and give talks on fish conservation. You could start organizing and encourage school clubs on fish conservation .... it would bring awareness to the parents who are fishers and many people in different areas.

Commenting on the point, one of the members said if the club were functional, even the young boys who fish illegally will get the message and as time goes on, they may start behaving differently and then they could also assist in fish conservation. The focus group members requested the college to take the initiative as suggested and make presentations in primary schools and also to organize clubs where young boys and girls could discuss issues of fish conservation.

4.9. Concluding summary

This chapter focused on the presentation of data generated from the research process. It gave an overview of the fishing community's local knowledge and views pertaining to the Malawi College of Fisheries curriculum. According to the data, a number of issues emerged from the fishing communities.

Most of the fishing communities, who were contacted during the research process, prefer Chambo fish to any other fish. The data also showed clearly that the fishing communities are concerned about the impact of different fishing methods currently operating in Lake Malawi. Among other fishing methods, they cited light fishing and trawl net fishing as the most destructive methods impacting on Chambo fishery (see section 4.3). The fishing communities therefore expressed the need for the students at the college to learn more about fishing methods and the impact they have on the fishery.

The chapter also looked at the role of regulations in the Chambo fishery and the contributions that fishers can provide to the college, realizing that they have relevant skills and experiences to share with the students. The fishers emphasized the importance of exposing the students to field activities so that they can to learn what the fishers are doing (see section 4.6). The fishing communities mentioned the poor coverage of extension services as a big setback to the extension programmes. They then proposed the introduction of fisheries courses in primary schools so that pupils start learning about fish conservation at an early stage and also share conservation messages with their parents and guardians at home. The fishing communities requested the Malawi College of Fisheries to take an active role in promoting conservation in primary schools along the lake shore by presenting talks on Chambo fish conservation. They also suggested the formation of wildlife clubs where primary school pupils could discuss and learn about fish conservation (see section 4.7 & 4.8).

The next chapter provides a more in-depth discussion of the research findings as these relate to the existing college curriculum. The discussion will also explore some of the opportunities to accommodate the findings of this study in a revision of the Malawi College of Fisheries curriculum.

CHAPTER 5

LOCAL KNOWLEDGE: IMPLICATIONS FOR THE MALAWI COLLEGE OF FISHERIES

"We cannot solve the problems of today with the same level of thinking when we created them" (Albert Einstein, cited in Ribbink, 2001).

5.1. Introduction

The local knowledge on the Chambo fishery and the roles of the fishing communities and the Malawi College of Fisheries were reported in chapter 4. This provided the first layer of data analysis reported through categories and sub-categories as identified through careful analysis of insights gained from the fishing communities in the two research areas (see section 3.5). The data provided rich information on the views of fishing communities on the Chambo fishery and also provided useful insights into how the MCF can draw on local knowledge to improve their extension officers' training.

In this chapter, I discuss the policy implications for the MCF curriculum in more depth (see also section 2.7.4), through an in-depth review of the existing curriculum, and through drawing on the findings in chapter 4, and the contextual and theoretical perspectives presented in chapter 2. To do this, I will look at the existing curriculum orientation, its content, skills and values by means of a careful analysis of the existing curriculum and the local knowledge as evident in the study. I will also look at the consistencies and inconsistencies in the current curriculum, as these relate to insights gained from researching local knowledge, as reported in chapter 4. I will then discuss how local knowledge and scientific knowledge can be integrated in the curriculum, thus encouraging inter-epistemological dialogue. This, it is argued, will enable the local communities to benefit from the training programmes, as the programme is likely to be more responsive to their needs and interests; and it will help to foster praxis (informed critical action) amongst extension officers. Finally I will discuss re-interpreting the framework of the MCF curriculum within a social constructivist epistemology (as discussed in section 2.10). This is discussed in relation to potential implications for the

imminent curriculum review, which is due to take place in 2005. Recommendations informing the curriculum review are based on this discussion, and are contained in chapter 6.

5.2. Policy and the Malawi College of Fisheries Curriculum

As indicated earlier, the Fisheries Policy on training stresses the importance of involving fishing communities and other stakeholders in curriculum development and implementation to address the needs of the fishing communities (see section 2.7.5). Lotz (1999) emphasises curriculum deliberations as a process to enable a more relevant and contextually situated curriculum (see section 2.9.2). The fisheries policy emphasises the importance of having a curriculum that reflects the needs of the people through their active participation. It also values the contributions of local communities because their practical experiences reflect the current practices and highlights their impact on the fishery (GoM 2001). As outlined in section 2.9, this introduces a different *purpose* to the MCF curriculum, which has implications for the curriculum orientation.

5.2.1. Orientation of the existing curriculum

The existing Malawi College of Fisheries curriculum is technocratic and it has a technical knowledge interest (as described in section 2.9.1). Cornbleth (1990) views a technocratic curriculum as a tangible product, usually a document or plan for instruction in a particular subject. The teaching and learning processes in this curriculum follow a plan of activities set out for the educators to implement. The curriculum is subject-centred and the educator's role is that of curriculum implementer. As indicated earlier (see chapter 1), the restructuring of the college followed a review of the curriculum, which was done by a consultant who hardly consulted the educators and did not consult the fishing communities at all (see section 2.7.5).

The orientation of the existing curriculum is thus primarily teacher-centred, focusing on more theoretical subjects, where learners are seen as receivers of knowledge, and the educators are referred to as 'experts' in various fields. This makes the curriculum quite rigid and the impact of this is evident in the research findings that graduating students

have practical deficiencies, which result in poor implementation of extension programmes (see section 4.5).

The orientation of the curriculum is different from the policy requirements in that it is eco-centric as it emphasises bio-centric information, and does not respond well to the socio-ecological needs and interests of the local communities who depend on the fish resources for their livelihoods (see section 4.3).

As noted above and in chapter 2, the policy recognises the important roles communities play in fisheries resource management and therefore stresses the importance of local community involvement in curriculum development and implementation. Communities have also expressed their interest in being involved in the College curriculum. Based on the findings in chapter 4, which illustrate the willingness of the fishing communities to participate in curriculum deliberations, it would seem that it is possible to argue for a shift in the orientation of the MCF curriculum, from a primarily technical orientation, to a more practical or emancipatory orientation. The perspectives of the fishing communities, however, show more evidence of a practical interest, as does the fisheries policy (as argued in section 2.9.1). It would seem, therefore that this may be an appropriate orientation to guide the curriculum review process in the first instance. Given the socio-ecological context and the impacts of poverty and other problems as described in chapter 2 (for example the taxation system that does not benefit communities), it would also seem appropriate to explore the possibilities of an emancipatory orientation to the curriculum, or a combination of practical and emancipatory interests in the curriculum revision.

5.2.2. Content, skills and values of the Malawi College of Fisheries curriculum

The current curriculum covers the following areas: -

- Fisheries science and resource management, which include courses in aquaculture, aquatic ecology, fish biology, stock assessment and fisheries statistics.
- Fisheries and technological development, which include courses on fishing gear technology, marine engineering, post-harvest technology and boat building.

- Rural development, which includes courses in extension principles and communication, business management and environmental education.

As noted above, the curriculum has bio-centric bias, because it focuses more on the acquisition of scientific knowledge as a way of responding to the fishing problems (see also 5.5.1 below), as defined by scientific research findings, and less on the people for whom the training programmes are meant/intended. The technical approach to the curriculum (described above) has resulted in an emphasis on fisheries science, resource management and technological development with less attention being given to rural development where the fishing community's views could be engaged.

The curriculum is also product-centred, and it has a well-defined product to achieve through a set of specified objectives, e.g. by the end of the period, students should be able to recite features of a female Chambo fish. What the lecturer requires in this situation is to make sure that the objective is achieved and that the learner is able to recite the features of a female Chambo fish. Other examples of objectives include defining the appropriate fishing methods used in specific areas. In this case the lecturer's interest is to describe different fishing methods. There is no emphasis on the implications or impacts of the different methods on the fishery or the fishing community. These objectives are primarily focussed on 'what' questions, not 'why' questions. They do not foster critical thinking or praxis. Tyler (1945) defines programmes of learning (curricula) using objectives to frame and direct the experiences of learning. The MCF curriculum orientation draws heavily on Tyler's objectives model, in that it that emphasises the use of objectives in the teaching and learning process. Its implementation is based on a set of objectives in order to address the aims and, as noted in the examples above, the emphasis is on objectives that are specific and achievable. The objectives-based nature of the curriculum makes it subject-centred and it is structured with very few opportunities for deliberative processes making it an expert-driven curriculum.

In this curriculum, the lecturers are simply viewed as curriculum implementers who make limited contributions to the development of the teaching and learning processes in the programmes. This is due to the structured way in which the curriculum is

presented (as a fixed syllabus). This is a result of the 'means-ends' approach to curriculum described by Stenhouse (1975, see section 2.9.2), which focuses mainly on the achievement of behavioural objectives. It also reflects an over-emphasis on the structural features of curriculum (as described by Cornbleth, 1990). According to Grundy (1987) a curriculum should not simply be a set of plans to be implemented, but is rather constituted through an active process in which planning, acting and evaluating are all reciprocally related and integrated into the process. Lotz (1999) notes that when developing new courses, it is important to know and to take into account the nature of the context and to be clear about the specific interest of participants.

As noted above, the existing curriculum relies heavily on scientific knowledge to address the issues associated with fisheries management. Beck (1992) argues that often the limitations of scientific knowledge systems create uncertainties that have limited our abilities to address environmental issues. Apart from scientific knowledge, we also need local knowledge that will influence and facilitate reflexive learning processes, involving critical thinking and action about certain issues. This process of learning, involving inter-epistemological dialogue (as discussed in section 2.10) provides the potential for reflections on "... taken-for-granted ways of understanding the world ... [and] continuous process[es] of generating [new] meanings" (Janse van Rensburg, 2001:13). This can open up possibilities for more research, and for an ongoing inter-epistemological dialogue, where different 'ways of knowing' work together to address issues and risks such as the decline in the Chambo fisheries, which is the focus of this study.

As indicated earlier, the fisheries policy on training stresses community involvement so that their needs are addressed, and their knowledge is incorporated into the curriculum. Thus it would seem appropriate to argue for establishing a new content framework for the curriculum, which draws on local knowledge through a deliberation process, so that the views of the fishing communities can be accommodated through dialogue, encounter and reflection (see section 2.7.5).

According to the results of the study, the existing curriculum lacks a focus on skills development because it is so technical and theory based and learners (the extension officers) are not given the opportunity to practice what they learn in theory. It thus

shows a lack of attention to praxis. As indicated in Chapter 4, the fishing communities indicated that the students from the MCF lack practical skills when sent to work in the field with them (see section 4.6). Lack of exposure to practical experience with the fishers results in poor skills development among the students (see section 4.6). As recommended by the fishing communities, it would seem that the students (extension officers) need more time to work with the local communities to develop their skills in the fishery, so that they can develop a better understanding of the impacts of the existing practices.

5.2.3 Course assessment

The teacher-centred curriculum, based on predetermined ideas of what a learner has to know (as described above), is measured through various forms of objective tests (Kawagley & Barnhardt, 1999: 118). A small percentage of the assessment at the college (20%) is allocated with assignments and practical sessions for the entire period of study. The largest percentage (80%) of assessment takes place in the form of end of term and end of year examinations. If a student fails at the end of the term, he/she is given a first warning, a failure in the second term examinations gets a serious warning and if he/she fails again during the end of the year examinations he/she is discontinued from the course.

This makes the process of writing examinations intimidating because it determines the student's place at the college. Lotz (1999) explains the importance of making assessment an integral part of the learning process, particularly among adult learners (see section 2.9.2). She, drawing on the work of Mukute (1999), indicates that involving learners in assessments through either peer assessment or self-assessment allows for a better understanding of the importance of assessment as a learning process. It also reduces the often negative consequences of judgemental approaches to assessment. Brown *et al.* (1995:79) note that involving the learners in deciding which criteria should be used to assess a particular task is an excellent exercise in understanding the whole assessment process. He goes on to say that participants are not only able to improve their work, but are able to help define what they consider worth-while learning in the course they are doing.

In the case of the Fisheries College, if learners were involved in assessing the progress of their learning situation as an ongoing process, the fears and tensions that are present even during the examinations may be reduced. The process would also be more beneficial as learners would become more reflexive of their own practice when doing things. This would be consistent with a different orientation to the curriculum, as discussed above. In my experience what actually happens in the examination driven approach is that learners study for examinations with minimal understanding of the educational process and in the end they have problems applying what they learn in actual situations, as indicated by the fishing communities in chapter 4. Janse van Rensburg and Lotz (1997) found that a process of reflexive, negotiated assessment and assessment criteria development enhanced the learning on the 1997 Rhodes/ Gold Fields course. As for the MCF, there appears to be a need to consider the potential to view assessment as a learning process, which may complement or extend the existing approach, which is predominantly focussed on judgemental assessments of learning. As argued by Lotz (1999), assessment, when viewed as integral to the learning process, is beneficial to the learners as they are more involved in establishing the value of the learning process. This could also be considered in the context of praxis-based assignment work, as described by Lotz (1999) in which she notes that work-place based assignments are an important vehicle for enabling praxis.

5.3 Local knowledge and the existing curriculum of the Malawi College of Fisheries

According to the results of the study, there are many things that are missing in the current curriculum which the local communities have highlightened as important for the students (extension officers) to have a better understanding of, so that they can work efficiently with the fishing communities (see chapter 4). Below are the major insights gained from the communities. The insights gained from the early deliberations with the communities through this research process as described in Chapter 3, are compared with the content of the existing curriculum, to shed light on the consistencies and inconsistencies that exist between local knowledge perspectives and the existing curriculum.

Table 2.1 Summary of the fishing community's views on what needs to be incorporated in the curriculum, compared with main content areas in the existing curriculum.

Local knowledge	**Existing curriculum**
1. Curriculum to emphasise the impacts of the current fishing methods more specially light fishing and trawl net fishing.	Covers how different fishing gear operates and also the design of different fishing gear, but does not go deep to look at the impacts of different fishing methods, e.g. light fishing and trawl net on the fishery.
2. Curriculum to emphasise and clarify the importance of regulations and provide a historical perspective on how people managed to sustain the available fish stocks.	General coverage of regulations and enforcement procedures, but there is no historic information to understand why things happen the way they do now and how the stocks were protected then.
3. Fishers to be involved in providing the lacking skills, knowledge and experiences to the college students wherever required.	Nothing is mentioned in the curriculum.
4. Students to be given opportunity to work and interact with the fishing communities so that they learn from them and also apply what they learn in class to the field.	There is a mention of students being sent on attachment, but with no specified outcomes and period.
5. Need for the extension service to change its approach so that it responds to the current situation.	Nothing is mentioned in the curriculum.
6. Introduction of fisheries courses in primary school so that pupils start learning about fish conservation at young age.	Nothing is mentioned in the curriculum.
7. Intensify wildlife activities in primary schools to assist the dissemination of information to areas that are not reached by the extension services.	Nothing is mentioned in the curriculum.
8. Nothing mentioned in the local knowledge	Fish farming (pond construction, water quality, fish breeding, feeding technology and pond management)
9. Nothing mentioned in the local knowledge	Stock assessment (measure of abundance, statistics and surveys, biological data, fish population dynamics and stock assessment and fisheries management)
10. The local knowledge highlightened the need for legislation, community-based fisheries management, but the rest have not been mentioned	Legislation (need for legislation, legislation options, fisheries act, enforcement, arrest and prosecution, and international cooperation)
1. Nothing is mentioned in the local knowledge	Fish biology (fish characteristics, taxonomic classification of fish, Malawian fish species, evolution and speciation, adaptation to aquatic life and external morphology of the fish)
12. Nothing is mentioned in the local knowledge	Post-harvest & technology (fish composition, post-mortem changes, fresh fish handling, fish preparation, fish curing, fish drying and fish freezing)

5.3.1 Consistencies between the existing curriculum and local knowledge

According to the results of the study (as reported in chapter 4 and summarised in table 2.1 above, there are a few things that are in the existing curriculum that have also been highlightened by the local communities as important to be incorporated into the curriculum. On fishing methods, the existing curriculum covers the design and operation of the fishing gear. Local communities look at the same fishing methods in more practical terms by looking at the impact of the fishing methods on the Chambo fishery specifically. As indicated earlier (see section 2.10), it is important to involve all the stakeholders in addressing the gaps that exist in the current curriculum through a continuous deliberative process. The existing curriculum also covers regulations and enforcement procedures, but local knowledge perspectives appear to consider this more deeply, by looking at the implications of the current practices on the Chambo stocks, and they ask critical questions about the way that legislation is currently administered (for example allowing commercial fisheries to operate during the closed season). The existing curriculum suggests practicals, for students but does not specify where the students should be working and as a result they end up in district offices instead of spending time working and interacting with fishing communities. The local communities emphasise the students' actual involvement with the fishers in the field so that they have an opportunity to learn and interact with the local communities.

The fishing community's interest is to have the students working directly with them in the rural areas, so that they are able to interact with, and get used to each other, while learning what they are doing as one way of improving their skills. This reflects a sophisticated understanding of praxis, and shows the fishing communities interest in a more praxis-focussed curriculum. The existing curriculum briefly covers issues such as the need for legislation, enforcement and the arrest of those who are fishing illegally, but the local communities have a stronger interest in providing the illegal fishers with community-based management options where they will be able to contribute to the management of the fishery. They appear to be interested in seeking solutions to the problems that exist. It is evident that the local communities share some common areas of concern with the MCF curriculum, but that in these areas of common concern, local communities seek a deeper meaning based on their practical experiences.

5.3.2 Gaps or inconsistencies between the existing curriculum and local knowledge

Comparing the existing curriculum with the local knowledge (as described in chapter 4 and shown in table 2), most of what is highlightened by the local communities as important is not in the existing curriculum and *visa-versa*. In the curriculum there is no mention of involving the local communities in providing the skills lacking at the college and yet this is what featured prominently in the study. The findings in chapter four reveal that the learners lack practical and historical knowledge, which the fishers have acquired over years of fishing. There is also no mention of reorientation of the extension services to respond to the current situation (of increased loss of Chambo stocks) in the existing curriculum, while this decline in fish stocks is of key concern for the fishing communities. The poor delivery of extension services emerged as a strong finding in the chapter four, indicating that the services are not effective and that there is a need to re-orient them and the associated training so that they respond to the current situation (see AMI; AMF; AMW).

The fishing communities spoke much about the inadequate coverage by extension services in most of the areas, and fishing communities came up with some good suggestions as to how this could be addressed (for example through wildlife clubs and primary school courses). There is no mention in the curriculum the an introduction of fisheries courses in primary schools or of any other strategies to address the inadequate coverage of extension services.

According to the discussion above, there are gaps (consistencies and inconsistencies) both in the local knowledge and in the existing curriculum that would seem to require a deliberative process in the revision of the fisheries management curriculum. This deliberation would appear to require a social constructivist epistemology that allows for meaning making and knowledge construction as fishers and college lecturers and students (extension officers) deliberate what is required in interaction with each other, drawing on their cultural understandings and their knowledge of the socio-ecological context (see Janse van Rensburg, 2001:12, cited in section 2.10).

5.4 Differences between local knowledge and scientific knowledge

Lotz (1999) and Cornbleth (1990) both argue that it is necessary that the curriculum contextualised, taking into account not only the learner's own life and realities, but also the concerns, interests, needs and aspiration of the local communities. It is evident from the study that the local knowledge highlighted by the local communities is practically oriented and does not place much value on technical knowledge, but rather requires a better understanding of why things are happening the way they are happening. This is reflective of Habermas's practical knowledge interest (as discussed in section 2.9.1). The local communities extend their understanding of specific practices to identify their impacts, thus also asking 'why' questions, which could also be indicative of an emancipatory knowledge interest. For example, the fishers were questioning why regulations were/were not being enforced in particular ways. They also questioned why commercial fishers were able to fish in particular areas (e.g. shallow waters), thus questioning the basis of unsustainable practices.

Most of what is in the existing curriculum is the provision of knowledge through lecturers and then enforcement follows to make sure that the knowledge is made use of, revealing an interest in control. This is reflective of the technical knowledge interest (as discussed in section 2.9.1). The results of the study reveal that the local communities seek practical explanations for problems affecting their livelihoods, and that they have an interest in praxis (as identified above). Janse van Rensburg and Le Roux (1998:108) comment that praxis constitutes deliberations on the why questions and involves asking why we do things the way we do and that the questioning affects what we do next. Local knowledge (as revealed in this study) seeks further elaboration and the provision of historical information so that people have a good understanding of what happened in the past, and why things are the way they are now in order to plan what needs to be done next to improve the situation.

Comparing the two, local knowledge and scientific knowledge, it is clear that the local knowledge is practically oriented and is rooted to the experiences and realities acquired after years of involvement in the fishery, while most of the knowledge in the curriculum is technical, scientific and facts-based with a lot of focus on the provision of

the scientifically proven knowledge, which is presented as ready for implementation and use.

As seen from the above (see table 2.1), there are many inconsistencies that require more collaboration between the local communities and fisheries in order to work out strategies for integrating the two different ways of knowing into the curriculum. As noted in chapter 2, Lotz (1999) comments that a well deliberated course curriculum should have the following features:

- It should be responsive to context and needs,
- It should have a good framework, but should allow for flexibility to accommodate different views and different ways of knowing,
- It should be participatory, allowing for different kinds of participation,
- It should be praxis-oriented, allowing for the integration of theory and practice, and for critical informed action, and
- It should consider assessment as part of the learning process as this allows for the development of self reflection.

The gaps in the current curriculum that have been exposed what the local knowledge requires would seem to require continuous deliberation in order to be addressed, and it would seem that these curriculum features (outlined above) could be considered in the forthcoming review. It is evident that both local knowledge and scientific knowledge can be used to complement and influence each other and, in the case of the MCF curriculum, the potential exists for this process to facilitate the improvement of training programmes.

5.5 Re-interpreting the framework of the curriculum

Cornbleth (1990:24) defines curriculum construction as an ongoing social activity that is shaped by "various contextual influences within and beyond the classroom". As noted a number of times above, the Malawi College of Fisheries curriculum is product-centred with technical interests aimed mostly at using scientific information in teaching and learning processes. There is thus a need to re-interpret the existing framework of

the curriculum. I discuss this with reference to Cornbleth's (1990) view of a structural and social-ecological curriculum.

5.5.1 Structural curriculum

The existing curriculum is structurally oriented with a focus on roles and relationships and specific modes of operation to address specific scientific recommendations and also share scientific beliefs and norms (Cornbleth 1990:28). This product-centred approach has led to a curriculum process guided by a structured syllabus and uncritical processes of curriculum implementation according to a set of behavioural objectives. This creates a 'delivery mode' for dealing with knowledge, and also results in knowledge that is decontextualised, and which is removed from the socio-ecological and socio-cultural context of the learning. It does not allow much room for the views of the learners apart from those provided through assignments and assessments undertaken by lecturers, at the end of the term and through end-of-year examinations. Falchikov (1995:159) notes that assessment of this type merely serves to lock an already closed door, rather than to open up possibilities of change and learning. Due to its structure curriculum prohibits learning among learners *and* lecturers and the latter are considered as experts while they strive to fulfil the requirements and prove that they are experts, bound by the structural and systemic features of the context in which they work. Further structural constraints include the fact that the curriculum is time-bound and that any topic in the curriculum is given a specific time, and each topic has be followed in a particular structurally defined order. Thus, by the end of the course, the planned work in the curriculum must to be dealt with, reflecting Stenhouse's view of a means-ends approach.

While an overemphasis on structure, as outlined above, can constrain a curriculum, Lotz (1999) argues that there is a need for some structure in a curriculum, when she argues for a 'flexible structure'. However, her argument states that there is a need for flexibility within structure, and as Da Costa et al. (1994) note, it would be difficult to think of a curriculum without consideration of some content or structure.

5.5.2 Socio-cultural curriculum

Cornbleth (1990) refers to a socio-cultural curriculum as one that reaches beyond the system or structural context, but involves aspects such as demographics, history, economic conditions, ideologies, beliefs and cultural dynamics (see section 2.9.2). The socio-cultural curriculum strives to respond to the structural curriculum by focusing on the relevance of the context. The study reveals that local knowledge has the potential to bring a stronger is socio-cultural dimension to the currently over-structurally defined curriculum. Key contributions from local knowledge would provide a stronger focus on practical and historically situated knowledge of the conservation and management of the Chambo fish, as well as some critical questioning of current practices.

As shown in chapter 4, the local knowledge values the history of the fishery, beliefs and other cultural dynamics in trying to understand the context of the problems being experienced now. A socio-cultural curriculum would seem to favour practical and emancipatory interests. As noted earlier, the local knowledge critically considers current practices in relation to their experience and how they affect their daily living. In order to respond to the structural curriculum, the socio-cultural curriculum aims to address issues of social, political, economic, traditional and ideological importance that works to influence the change in the curriculum (Cornbleth 1990), and in reviewing the MCF curriculum, it may be important to consider a stronger focus on the socio-cultural curriculum.

5.5.3 Curriculum deliberation

As noted above, there appears to be a need to establish a process of curriculum deliberation to review the MCF curriculum, which draws on local and scientific knowledge and which considers the structural and socio-cultural dimension of curriculum, and which emphasises practical and emancipatory knowledge interests. Reid (1997:189) defines deliberation as an intricate and skilled intellectual social process whereby, individually or collectively we must respond, establish grounds for deciding answers and then choose among the available solutions. In the context of the MCF, efforts to consider the appropriate approaches and solutions to the curriculum need to be done in consultation with the college lecturers and local communities to

allow their skills, knowledge and experiences to be incorporated into the curriculum. Lotz (1990:40) comments that presenting a curriculum as an open-ended, flexible deliberation within a framework for curriculum development "might enable adult learners to become partners in defining the purpose and orientation of their own learning". As indicated in the findings of the study, a well-deliberated fisheries management curriculum could well benefit from the participation of local communities in the planning and implementation of the curriculum.

5.5.4 Curriculum praxis

According to Grundy (1987), curriculum as a social process develops through dynamic interaction of action and reflection. This reflects a praxis orientation to curriculum. "Praxis implies a conscious recognition of the relationship that exists between practice and its rationale(s)". This would, for example, require a careful consideration of the rationale between contemporary fishing methods, and the practice of fishing as well as consideration of impacts associated with different fishing methods. As indicated by the fishers in chapter 4, they recommend that students (extension officers) work more closely with them in the field in order, to encounter the different fishing methods currently in use, and that they also adapt their knowledge according to changes in fishing practice. This would be a good example of how a stronger praxis orientation can be built into the MCF curriculum. Another way of developing a stronger praxis orientation is through inviting the fishers to 'teach' at the college and share existing experience. This brings the learning closer to the realities of practice.

The study has reflected the existing inconsistencies in the curriculum and provided insight into the potential of considering local knowledge that could influence action and praxis in the context of a curriculum review (see 5.3.2 above). Grundy (1987) and Usher et al. (1997) note that learning takes place when grounded in real experiences, not in hypothetical examples. The local knowledge explored in this study based on the local community experiences, has the potential to provide such grounding for a revised curriculum, and to ensure a stronger focus on praxis in the curriculum.

5.5.5 Social constructivist epistemology and the curriculum

As explored in this study, the potential exists for the MCF curriculum to respond to the needs of the fishing communities, but by doing so it will need to reflect the community's socio-context, and it would need to draw on their knowledge. As argued above and in chapter 2, this requires that the curriculum be based on a social constructivist epistemology. This epistemology also has implications for the actual learning processes that take place. Commenting on the contextual relevance in learning and development Rogoff (1995) comments:

> The process of learning and development should draw attention to how personal efforts, interpersonal relationships and culturally structured activities constitute each other.

As evident in the study, the local knowledge that currently exists is result of long experience and is generally passed from one generation to the other. Local communities continuously look back to the earlier practices to see how they have changed over time, indicating that a social constructivist approach to curriculum should also be socially and historically grounded. Lotz (1999) comments that this epistemology provides a framework for education that allows learners to explore new ways of responding to the challenges of socio-ecological change, and to themselves foster relevant change. This is consistent with Janse van Rensburg's (2000) description of social constructivist epistemologies that allow for the generation of new ways of generating knowledge and creating opportunities for transformation (see section 2.10). It is argued that, in considering the review of the MCF, a social constructivist epistemology be considered as the basis for the curriculum review.

5.6 Concluding summary

In this chapter, I have provided an overview of the fisheries policy and the Malawi College of Fisheries curriculum where I have examined at the orientation of the existing curriculum, content, skills and values and their implications for a curriculum review. I have also compared local knowledge and the content of the existing curriculum and I have identified a number of consistencies and inconsistencies that

have implications for the curriculum review process. This has led me to consider the differences between local knowledge and the scientifically oriented curriculum and the implications for a curriculum review. I have also gone further to re-interpret the curriculum by examining the theory behind the curriculum. Here I have focused my discussion on the contextualised curriculum by looking at structural and socio-cultural concepts of curriculum, curriculum deliberations and curriculum praxis. Finally I have considered a social constructivist epistemology as a potential foundation for the curriculum review, arguing that this epistemology has the potential to allow for curriculum deliberations between the college and the fishing communities which it serves. In the next chapter I summarise the study, and make more specific recommendations, based on the arguments presented in this chapter, and the data presented in chapter 4.

CHAPTER 6

SUMMARY AND RECOMMENDATIONS

"...adult education is a place or critical discussion of social [and socio-ecological] developments and their impact for [sustainable development and] personal and social life" (Jansen and van der Veen, 1996:134).

6.1. Introduction

In this chapter, I will provide a summary of the study and the recommendations arising out of the research. I will outline a summary of the findings in relation to the research question. As was seen in the previous chapter, the second layer of data analysis provided a picture of the consistencies and inconsistencies that exist between local knowledge and the existing curriculum (see section 5.3), and it provided an in-depth review of the existing curriculum, in relation to the changes in policy and curriculum purpose. In this chapter, I will first give a summary of the study, then focus on curriculum orientation, curriculum content and praxis, curriculum deliberations and make recommendations for an ongoing curriculum review and evaluation and I will finally provide a concluding summary of the research.

6.2. Summary of the study

This study focussed on local community contributions to the existing curriculum at the MCF and the research question was: What contributions could local communities make to the existing Fisheries Management curriculum for the Malawi College of Fisheries? The study was focused on the Chambo fish. As indicated in chapter two, the Malawi College of Fisheries runs three types of courses and the research is mainly focused on the pre-service course curriculum for extension officers (see section 2.7). The orientation of the courses at the college is teacher-centred because it has framed a curriculum document with specific objectives to be achieved and this document is what guides teaching and learning processes. The curriculum was developed and

reviewed by outsiders, who are referred to as curriculum experts and the lecturers are seen as implementers. There were no contributions from the local communities (see section 2.7). Grundy (1987) sees this type of curriculum as narrow, as it is only seen as a product, and it represents a technical knowledge interest.

The study has shown that the training programmes run at the college are biased towards scientific research and that they neglect the social values of the communities who are utilising the resources (see section 2.5.1 and chapter 4). The study has shown too that the fishing communities have rich and useful knowledge that could help to improve the curriculum and training programmes at MCF for the conservation of Chambo (see chapter 4). As argued by Kinyanjui (1995:2), the environmental education programmes at the college need to be rooted in the local communities' knowledge and experience and local participation, knowledge and orientation, so that they can also focus on real issues on the ground. The curriculum guides the training of students, who, after graduating, work with the local communities as extension officers. The involvement of these local communities in curriculum development and implementation is important for the success of the students, as noted in the findings of the study. Usher *et al.* (1997:33) points out that adult learners seek knowledge that is relevant to their life experiences. The scientific knowledge that is in the curriculum seems foreign to the fishing communities, because it does not reflect what they know about the Chambo fishery. This does not, however, mean that this scientific knowledge is invalid, merely that a more deliberative orientation needed, which considers both scientific and local knowledge.

Cornbleth (1990) emphasises curriculum as a contextualised social process, which involves people in participatory approaches to curriculum to allow for a more contextually located curriculum process. The Malawi College of Fisheries curriculum seems to require a different focus where instead of it being seen as a product, the curriculum can be viewed as a process where the scientific knowledge and the local knowledge will work together through a process of inter-epistemological dialogue to find solutions to the conservation of Chambo fish. Cornbleth describes a curriculum as an ongoing social process and Lotz (1999) refers to this type of curriculum as open-ended, responsive and participatory with a flexible structure. As seen from the study, recognition and acceptance of the local knowledge in the conservation of the Chambo

fish may open up opportunities for further research and provide learning opportunities for the students and lecturers at MCF and the local communities who depend on the fish for their livelihoods.

Grundy (1987) views curriculum as praxis where it is constructed within actual learning situations, she sees learning as a social process and knowledge as socially constructed. The research has revealed that the local communities strongly feel the existing training programmes at MCF do not reflect the true picture of the current fisheries practices and their impact on the Chambo fishery (see section 4.7). Fishing communities also expressed concern that the students from the college lack practical knowledge and that for them to be equipped with more up to date and contextually relevant knowledge, they need to be exposed to the fishing communities and work with them (see section 4.6). The exposure of the students to the different field activities as practiced by the fishers may also provide opportunities for them to interact with the fishing communities. This has the potential to extend the scientific knowledge that the students may have acquired at the college, which is also important in the conservation of Chambo.

The curriculum as a contextual social process needs to reflect what exists and address the social, cultural and economic needs of the local communities. It should reflect their practical and emancipatory knowledge interests, as well as the more technical knowledge interests that it currently favours. Janse van Rensburg (2001) argues that the construction of new knowledge is always based on the foundation of what learners already know. As seen from the study, the local knowledge should provide opportunities for learning from what fishers already know.

It would seem that the college needs to have a curriculum that integrates the scientific knowledge with the local knowledge that the fishers have acquired over years of fishing because the local knowledge provides real practical information on the Chambo fishery, and the issues that are putting the fish stocks at risk. The fishers appear to have the capacity and commitment to provide the skills, knowledge and experiences that are lacking in the college by either letting the students work with them, or through contributions at the college, where they can provide whatever local knowledge might be required at a particular time (see section 4.5).

The study therefore recommends ***a process of curriculum deliberation*** *amongst communities, lecturers and students, and proposes* ***a social constructivist epistemology, involving inter-epistemological dialogue*** *as framework for the curriculum revision.*

6.3. Recommendations for the curriculum orientation

As noted chapter 2 and chapter 5, the fisheries policy recognises the important roles communities play in fisheries resource management and therefore stresses the importance of local community involvement in curriculum development and implementation. Findings in this study have indicated that communities have an interest in being involved in the College curriculum. As argued in chapter 5, there is the possibility of a shift in orientation in the MCF curriculum, from a primarily technical orientation, to a more practical or emancipatory orientation. As noted, the policy and community knowledge shows a practical knowledge interest, but community views also reflect aspects of an emancipatory interest.

Given the socio-ecological context and the impacts of poverty and other problems as described in chapter 2, and as argued in chapter 5, *this study recommends that the possibilities of a* ***practical orientation*** *to the curriculum, or* ***a combination of practical and emancipatory interests*** *be explored in the curriculum revision process.*

This will involve, for example the following:

- A greater concern for historical perspectives (how things were done in the past)
- Inclusion of more 'why' questions in the curriculum (e.g. why legislation is not implemented appropriately)
- Stronger focus on practical ways of doing things (e.g. using different fishing methods)
- A stronger focus on practical activities, and working with the fishers in real-life contexts
- Stronger critical views on issues (e.g. the use of light fishing and trawl fishing)

- The introduction of wildlife clubs and primary education courses to extend extension service functions

It will also involve **a more participatory approach** to the curriculum. As indicated before (see chapter 2), a curriculum that is participatory will allow the voice of the fishing communities to be heard and their views to be considered in the curriculum. In trying to emphasise the importance of participatory approaches to the development of the curriculum ACEE (2002/3) notes: -

> With the need to consider environmental issues in local context in environmental education response, environmental education practitioners have, in recent years sought to involve more people in participatory approaches to curriculum and resource development in order to enable more contextually located curriculum processes that are responsive to issues in socio-ecological contexts.

It is evident from the study that the current MCF curriculum suffers from a lack of consultation and deliberations with the fishing communities and other stakeholders, which results in a lack of contextual relevance and dissatisfaction amongst the resource users. The results of the study also reveal that the concern for the decline of the Chambo fish is not only felt by government, which has assumed responsibility for the management of the fishery, but is as acute amongst the fishing communities whose livelihoods depend on it (see section 5.2). According to the ACEE notes (2002/2003), a curriculum that is socially constructed pays more attention to the contextual factors, including the design of the curriculum. This will introduce a more **responsive approach** to the curriculum design. It is important to re-orient the MCF curriculum and be mindful that the limiting factors on the current curriculum have been a lack of consultations and deliberation.

Lack of community involvement in the existing curriculum has also been a key area of concern in the study. Of particular concern is the outcome of the lack of deliberations and sharing of ideas between the fishing communities and the college in the management of the fishery, which has partly resulted in the college producing extension workers with limited practical skills. As indicated by McIvor (1999:84), theory is important, but we need practical experiences in order to understand it well. As seen from the study the interaction between the fishers and the college (students, lecturers

and fishers), is one of the major requirements of the existing curriculum and this can be done in two ways, inviting fishers to come and provide the missing skills and experiences for the students and also expose students to the fishers for practicals in the field (see section 5.3). This will ensure a stronger **praxis-based approach.**

This study therefore recommends that the following approaches be considered in the curriculum review process:

- ***Participatory** approaches*
- ***Responsive** approaches*
- ***Praxis-based** approaches*

In order to shift from the current curriculum, which is a product to the process of developing a curriculum, that is open-ended and one that reflects the needs of the people, it would seem that a more **reflexive approach** is needed, where there is an opportunity for critical reflection and evaluation on what is taking place in the classroom and in the field. This study has shown that the college needs to be more aware of what is actually happening in the field where the students are working with the fishing communities. A continuous monitoring strategy needs to be put in place to make sure that the college gets feedback from the fishing community on an ongoing basis, so that it can to respond and adjust accordingly.

*This study therefore recommends that a **reflexive approach** be considered in the curriculum review process, and that a monitoring strategy is established to ensure ongoing reflexivity.*

6.4. Curriculum content and praxis

According to the study, the local community contributions seek a curriculum that focuses on practical knowledge and one that is able to provide immediate solutions to the existing problems. The existing curriculum focuses on theory that responds to the scientific recommendations (see section 2.5.1 and chapter 5). Most of the practical experiences that local communities have are not reflected in the curriculum and this leads to a lack of practical skills amongst the students (see section 4.7). As pointed out earlier, the current curriculum has more technical interests and values the scientific

approach as the only means to fisheries management. As outlined in chapter 5, assessment practices are integral to the way a curriculum functions, and to address the dominance of a technical interest in the curriculum, an exploration of different approaches to assessment, which emphasise learning rather than judgement, need to be explored.

This study therefore recommends that ***both scientific and local knowledge be considered*** *as content for the revised curriculum.*

The study also recommends that more attention be paid ***to the skills of extension workers****, through a stronger focus on praxis, as noted above.*

This study recommends that the potential of ***assessment approaches that strengthen learning*** *are explored in the curriculum revision process.*

6.5 Curriculum deliberations

The study confirms that the existing MCF curriculum is top-down and closed to contributions from the local communities, students, lecturers and other stakeholders (see section 2.7). According to the study, the curriculum requires change to address the gaps identified in the study, which indicate that when learners are sent to work with local communities in the field they experience problems because they are not familiar with existing practices (see section 4.6). The study confirms the need to have a socially contextualised curriculum where local communities, students and lecturers can deliberate what needs to be covered in the curriculum (see section 5.5). As argued in chapter 5, a curriculum that is open-ended and more flexible, allows both learners and educators to learn from each other and in this case the educators are not seen as the only experts.

IDRC and Sida (1997) argue that reflexive and critical environmental learning needs to be participatory and recognise learners as contributors .... in a cultural and ecological context and should aim to incorporate scientific and local knowledge in addressing environmental issues. This study has shown that such deliberation is possible, and that it can be taken further to extend the curriculum revision process.

This study recommends that ***the process of deliberation on*** *the MCF curriculum, started in the context of this study,* ***be extended*** *during the curriculum review process.*

6.6 Ongoing curriculum review and evaluation

The MCF was last reviewed in 1994 and changes that have taken place over the past ten years are not reflected in the curriculum. According to findings in this study, fishers keep on modifying their gear to increase their catches in relation to the ever-declining fish populations (see section 4.3). Janse van Rensburg and Lotz (1998) comments that to address the complexity of environmental issues and risks, we need to develop curricula for environmental processes that are ongoing, critical and responsive. It is evident from the study that the existing MCF curriculum lacks responsiveness to changes in local practice and context. The process of reviewing and evaluating the curriculum, which has started that this study, and which will continue in 2005, will hopefully enable all the stakeholders involved to see what is working well and what is not and discuss what needs to be done in response to changes taking place in the context.

As seen from the study, the local communities seek more understanding of the existing practices and keep on asking why the current practices have resulted in the decline of the Chambo fish catches. They also show an interest in trying to find out what is going wrong, and how things can be improved.

This study recommends that the MCF ***establish a process for ongoing curriculum review and evaluation*** *so that we are able to identify emerging changes in context and through an ongoing evaluation process find workable solutions.*

6.7 Concluding summary

In concluding this study, I again note Popkewitz (1984) who sees knowledge as essentially value based and historically grounded within a specific context, time and space. The study has shown that local communities have knowledge that is practical, real and that they base their understanding on a historical perspective in order to

understand why things have changed in particular ways. This historical understanding also helps one to think of better and more effective strategies in order to deal with different environmental issues in context. The study has also shown that local communities also ask critical questions about why things are the way they are.

Based on the review of the existing curriculum presented in chapter 5, the purpose of the curriculum appears to have changed, and the existing technical approaches to the MCF curriculum appear to be inadequate to respond to the issues that are arising in the current context of fisheries management in Malawi. The existing curriculum has implications for both the implementation practice and the effectiveness of the students (the extension workers) because they end up having no practical experience and as a result, have problems in working with local communities. This impact on their ability to contribute to the conservation and sustainable use of the Chambo fish. This study has argued that, in order to have a curriculum that is socially contextualised there is a need to consider revising the curriculum in such a way that both scientific and local knowledge can be brought into focus in the curriculum, so that they influence each other in the implementation of the curriculum (through inter-epistemological dialogue).

The study has recommended that a deliberative process be adopted in the review of the curriculum, and has noted that this may enable MCF staff and students to address the needs of the local communities, and more effectively address the arising socio-ecological risks in the Malawi context, with specific reference to the decline of the Chambo fishery. This may assist both the government, and the local communities to respond more appropriately to the ongoing depletion of Chambo in Lake Malawi, and to find ways of restoring the Chambo catches to their previous levels.

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Appendix 1

KI4

INTERVIEW SCHEDULE FOR THE FISHING COMMINITIES

A Demographic profile

Date 15-05-09

Name of village & area Kcca-Makava

Occupation Fisher

Sex Male

Age
- 10 – 15 years
- 16 – 25 years
- ✓ 26 – 35 years
- 36 – 45 years
- 50 years above

Educational qualification

Standard
- ✓ 1 - 5
- 6 – 8

Form
- 1 - 2
- 3 – 4

B. Questions

1 (a) What type of fishing activity are you involved in?

Chilimila pishing operated during the day and night

(b) Why are you involved in this fishing activity than any other fishing activity?

This is the pishing activity that I can get some income to sustain myself.

2 What do you fish for?
- For home use
- For sale
- ✓ For both
- Others – specify

3 (a) What type of fish species do you normally catch?

I usually catch usipa and other mixed small species, because it is difficult to catch Chambo these days.

1

Appendix 1 continued.

(b) Why do you think you catch this fish species than any other fish?
These are the fish species that are available and also depends on the type of net that I use

4 (a) What type of fish do you prefer?
I prefer Chambo

(b) Why do you prefer this fish species?
When taken to the market or right at the beach gives more income

5 (a) What changers on the catches of Chambo have you experienced over the years?
Chambo catches have drastically declined if we compare today catches and those from years ago

(b) What do you think have been the causes of these catch trends?
People do not observe regulations, the government do not efforce the regulations, the outreach programmes do not convice fishers

6. How do you work with your extension officers who come to advice in the proper management of the fisheries resources?
We usually meet during the BVC meetings but sometimes do not see their role in the community

7. As someone who has been in the fishing industry for some time, how do you think you could contribute to the training programmes offered at the Malawi College of Fisheries?
I think the students need to know the previous fishery and how it has moved to today situation. We need to let them know how we used to catch fish

8. What areas in the management of Chambo fish do you think need to be covered when training the students at the college that you think these students lack when they come to start their work in the field?
Use of light fishing is a big threat to the Chambo fishery illegal nets need to be stopped, At times the students should be visiting the beaches to see what type of fishing gears are used.

9 (a) What is the best time to fish Chambo?
During the rainy season - Jan - April.

(b) Why do you think is best to fish it the time you have mentioned?
Chambo fish move from the deep waters to the shallow waters for feeding

Appendix 1 continued.

10 (a) Where is most of the Chambo fish found in the lake?

Chambo fish is mostly found near the mouth of Shire river

(b) Why is it commonly found in the area you have mentioned?

There are a lot of vegetations where fish feeds and also hide in the marshes

11 What local practices do you do to assist in the conservation of Chambo in your area?

NSC advising other fishers using illegal nets to come at our beach.

12 What other things do you think need to be done to make sure that the technical assistants that are trained at the college are able to perform when they are sent in the field?

- Respect and importance of regulations
- Call communities (fishers) to chart with students
- Investigate the impact of light fishing

Appendix 2

GUIDING QUESTIONS FOR FOCUS GROUP DISCUSSIONS.

1 Many people say they prefer catching Chambo fish rather than any other fish species. What comments would you give?

2 What do you think has been the effect of people's preference for Chambo in relation to its catch trends?

3. How do you think the Fisheries College could assist in the training programmes in attempting to conserve Chambo?

4 What role do you think would contribute to make sure that whatever is taught reflects your experiences and knowledge in the fishing industry?

5. What other things do you think would assist in the conservation of fish in your area?

Appendix III

ACTIVITY III OF THE RESEARCH PROCESS

Workshops with fishing communities in area 2.1 (Kela Makawa) and 2.2 (Malindi)

After the two methods of data collection (interviews and focus group discussions) a number of issues emerged that required more probing and discussions with the fishing communities in the two research areas. Two workshops (one in each area) were planed and focused on the following questions: -

1. What were the most popular fishing business years back in your area?

2. What have been the catch trends of the Chambo fish in this area?

3. What impact has the Fisheries field staff made to the current status of Chambo in the area?

4. Mention and discuss some of the issues that you feel Fisheries Department has been working on in the conservation of Chambo?

5. What are some of the areas that you think need some improvements in the conservation of Chambo fish?

6. How do you think teaching and learning would be improved at Malawi College of Fisheries for the better delivery and implementation of Chambo Fisheries Management programmes?

7. What other ideas do you have on the conservation of Chambo in relation to the training programmes conducted at Malawi College of Fisheries?

Appendix III continue

WORKSHOP I

Workshop deliberations for area 2.2 (Malindi)

Date: 10th June, 2004

Venue: Malindi Primary School Hall

List of participants

1. G. V. H. Makumba - Fisher
2. G. V. H. Chindamba - Fisher
3. Mr. M. Mwawa - Fisher
4. Mr. W. Katenga - Fisher
5. Mr. A. Sumani - Fisher
6. Mr. M. Mtusi - Fisher
7. Mr. H. Pota - Fisher
8. Mr. W. Kadewere - Fisher
9. Mrs. M. Mbwana – Fish trader BVC member
10. Mrs. J Imedi – BVC member
11. Mrs. B. Chilanga – Fish trader BVC member
12. Miss C. Maloya – fish trader BVC member
13. Mr. K. Chikhungu Fisheries Assistant for the area
14. Mr. J. Perani Fisheries supervisor for the area
15. Mr. S. Mwawa Driver
16. Mr. D. K. Kachilonda researcher and facilitator for the workshop

After presenting some of the main highlights that emerged during the interviews and focus discussions, participants to the workshop went into groups to critically look at the mentioned areas. Three groups of four were formed and after one hour of discussions each group came with a list of things that were discussed. The following were things that were discussed: -

Group A

1. The most popular fishery years back was beach seine that was targeting Chambo.

Appendix III continue

2. Chambo catches were very high in those years, but have declined because there are a lot of fishing nets and fishers now operating. The other reason is that there is less security for Chambo fishery now that most of the fishers are fishing illegally.

3. The government through the Fisheries Department continues to advising people on better fishing practices, but they keep on ignoring whatever is being said.

4. Some of the fishing messages that we can transmit to fellow fishing communities are on the importance of conserving Chambo so that our children will also find it available.

5. Fisheries Department should be getting those experienced fishers to assist in giving the background history of Chambo fishery to the students because most of it is not documented. "Some of you do not come from this area. Do you know the history behind Chambo fish and if you don't know what do you teach the students at the college?" The presentations could be in our local languages and you can now translate it into English after we have given you the most important areas of the Chambo fishery.

6. During the closed season, light fishing, nkacha fishing and beach seine nets should not be allowed to operate. In line with these, the students should first be taught how these methods operate, types of fish caught and some of the dangers of using these methods. Apart from the lecturers, the fishers can give well-grounded information from their experiences gained over years.

Group B

1. The most popular fishery years back was the Chambo fishery though Chambo seine nets.

2. Chambo catches have declined as compared to years back due to increased number of fishers and fishing nets that are operating in the South East Arm of Lake Malawi.

3. Fisheries Department through Fisheries Assistants works with fishing communities on better practices of fishing and the dangers of illegal fishing.

4. Some of the effective messages on the conservation of Chambo fishery are: -

    - Radio programmes for example "Usodzi WA Lero" (Today's Fishing) programme, which reaches a lot of people per time broadcast.
    - Messages through chiefs, local leaders and BVCs, but must have support from Fisheries Department.

5. The students at Malawi College of Fisheries should be told the importance of working together with fishing communities on the conservation of Chambo.

Appendix III continue

6. Students should also be told the importance of ownership of the resource and that everybody should be accountable.

7. The college should at times utilize the experiences and expertise that exist amongst chiefs, local leaders and the entire communities on fishing methods and some of the things that need to be followed in the conservation of Chambo. The chiefs should be encouraged to strengthen local regulations on the conservation of natural vegetation and wetlands for the maintenance of Chambo's breeding grounds along the shores.

Group 3

1. The most prominent fishery years back was gillnetting for Chambo.

2. There was a lot of Chambo because the number of fishing nets and fishers was less compared to these days when the numbers have increased so much.

3. Fisheries Department through its field staff advises fishers on better ways of fishing in order to conserve the Chambo.

4. Messages on closed seasons during the breeding season for Chambo have been intensified all along the lakeshores in all BVCs. The local chiefs and Fisheries Assistants should work together to make sure that they carry the same message and in the process conserve Chambo.

5. The Malawi College of Fisheries should intensify on the regulations that would facilitate people's understanding of the importance of the conservation of Chambo. It is important for the fishers to play a role in giving some background information (history) on conservation measures on the Chambo. This could be done on frequent visits to the college by fishers to give some presentations to the students. Also the students should be given chances to go and practice what they will be doing after graduating from the college, just like what teachers who at teachers training college do. This could assist the fishers and the new technical assistants to know each other before they graduate.

6. The students should be taught some of the techniques of spreading the messages on illegal fishing, fishing during the closed seasons, use of under meshed nets and catching of immature Chambo. Also there is a need to find ways of emphasising the negative impacts of light fishing, which has caused a lot of damage to the Chambo fishery in South East Arm of Lake Malawi.

NB: It is important for the students to know how different fishing techniques are operated and some of the expected problems.

Appendix III continue

WORKSHOP II

11th June, 2004

Area 2.2 (Kela Makawa area).

Venue: Malawi College of Fisheries Hall

Participants to the workshop were:-

1. Mr. L. Nyirenda - Fisher
2. Mr. W. Thom - Fisher
3. Mr. J. Azizi - Fisher
4. Mr. J. Harawa - Fisher
5. Mr. E. Luwera - Fisher
6. Mr. K. Mbaya - Fisher
7. Mr. A. Chida - Fisher
8. Mr. M. Yusufu - Fisher
9. Mr. K. Mzumala - Fisher
10. Miss. C. Simeji – Fish trader
11. Mr. F. Kokha – Fisheries Assistant for the area
12. Mr. B. Joshua – Fisheries supervisor for the area
13. Mr. D. K. Kachilonda – Researcher and facilitator for the workshop

This workshop had ten participants from the twelve that were invited. The number was a bit less because the day was a quite busy day for some fishers and business people in the area because it was a market day. We therefore had two groups for the discussions instead of three as previously planned. We used the same questions as the first workshop and the procedure was the same as for the first workshop.

Group A

1. Beach seines of 3" mesh size, which was used to catch Chambo fish was the most prominent fishery years ago.

    - There was also fishing net of 1" mesh size that used to catch Kambuzi (Hapcrospecies).

Appendix III continue

2. Chambo catches use to be very high years back, but the catches have declined due to trawl nets that were introduced by Fisheries Department in the South East Arm of Lake Malawi. These trawl nets destroy all the Chambo nests and breeding grounds along the lake..

3. The Department of Fisheries gives very good advice on the conservation of Chambo, but the problem is that it does not offer any financial assistance to fishers as one way of improving the fishing industry.

4. a. During the closed season, it is also very important to advise young children who drag small meshed nets along the shores because in the process, they catch young Chambo that would have been good mature fish tomorrow.

   b. Fisheries department should revise their regulations so that when everyone is observing closed season during the breeding period for fish, no one is seen fishing. What is currently happening is that while small-scale fishers are observing closed season, commercial and semi-commercial fishers are busy fishing and in the process the reason for having a closed season is ignored.

5. a. The College of Fisheries should intensify its training on the conservation of Chambo fish because it has been our pride for many years; a lot of people have been depending on it and the country has been gaining some foreign exchange from Chambo as it was sold outside the country. Students need to be told how things were in the past, how they are these days, how Chambo was caught a long time ago, how it is these day and why we have the current experiences. If you do not have the history then it would be better to involve people who have some knowledge and experiences e. g. fishers, some elderly people and those who may have better knowledge. "Students from the college should not only have book knowledge because some of the knowledge you get from books is European based and may not be what we should have here". The presenter continues "How many times have we offered some knowledge to the Europeans?"

   b. Another very important area to think of is putting fisheries conservation ideas in the primary school curriculum. School children should start at a young age to learn the importance of fish conservation.

   c. Fishers should also be given a chance to be with the students both at the college and in the field. One of the problems is that students are not told what they are expected to meet in the field and after graduating they meet completely strange things in the field. "We need to tell these students the truth about the Chambo fishery and what went wrong for us to loose our very important fish." You have book knowledge, but we have the experiences as people who have been fishing for a very long time. Fishers will not expect any payment if you do not have the money to pay!!

6. The students from the college should be given time during their training to go and visit fishers at different beaches. This will assist them to see and know

Appendix III continue

7. What is actually happening and at the same time get used to the fishers and the situations in the field so that they gain confidence

Group B.

1. The most common fishery years back were:-
   - Gillnetting for Chambo
   - Seine nets targeting Chambo
   - Fish traps, which also used to catch Chambo

2. The Chambo fishery has declined these days compared to the old days, due to the increased number of fishers and fishing nets operating in the South East Arm of Lake Malawi

3. The Fisheries Department, through its field staff, have been advising fishing communities on better ways of fishing to sustain Chambo catches and one of the examples has been not allowing fishers to catch Chambo during the closed season when it is meant to be breeding.

4. Some of the fisheries programmes that assist in the conservation of Chambo are:-
   - Radio programmes through "Usodzi Wa Lero" (Today's Fishing)
   - Policies on fishing and fishery in natural water bodies

5. The Malawi College of Fisheries should make sure that there is emphasis what the students are taught like:
   - Legality of the fishing nets and period for fishing as they exist in the policy documents.
   - Importance of observing the prevailing regulations as one way of regulating the amount of fish that is to be harvested.
   - Students should be taught the importance of fishing off shore to given chance to the Chambo fish to re-generate.
   - The students should also be taught some of the indigenous ways of catching and conserving fish. This could be done by inviting BVC members, fishers, who have been catching fish for quite a long time to be with the students in the field before they graduate and also at times invite them to come and share some experiences with the students at the college.

6. a.The students from the college should be taught the dangers and the impact of light fishing to the Chambo fish. If the college has no information about it, then the fishers could be invited to give a talk about some of the fish behaviours in relation to light fishing.

Appendix III continue

b. It is important that students are given some time to be with the fishers along the beaches so that they get used to them and the situation in the field and what is currently taking place compared to the knowledge they get from the theory part of the course.

Appendix 4

Analytic memo interviews (AMI) detailing responses from the interview schedules with fishing communities in areas 2.1 (Kela-Makawa) and 2.2 (Malindi).

Summary of main issues obtained in the interviews, which, were conducted in the two research areas (2.1 – Kela-Makawa and 2.2 – Malindi). Twenty-seven interview schedules were administered, twelve in area 2.1 and fifteen in area 2.2. As part of the fishing community, a cross-section of people was interviewed and these included fish gear owners, crew members, fish traders.

Table 1 (AMI) Main issues emerging from the interview schedules

Category	Brief summary of comments	Respondents
Preference fish	• Prefers Chambo because it fetches high price at the market	KI1; KI2; KI3; KI4; KI5; KI6; KI7; KI8; KI9; KI10; KI11; KI12; MI4; MI5; MI6; MI7; MI8; MI9; MI10; MI11; MI12, MI13; MI14; MI15
	• Prefers Chambo because it is delicious	KI5; KI9; KI10; MI4; MI5; MI9; MI10; MI14
	• Prefers Utaka because it is profitable	MI1; MI3
	• Prefers Catfish because they are big & give more money	MI2
Fishers to provide lacking skills & knowledge to the college	• We can provide historical background of Chambo	KI1; KI2; KI4; KI5; MI1; MI6; MI7; MI8; MI12
	• Can provide skills, experiences gained over years about fishing	KI5; KI6; KI7; KI11; KI12; MI2; MI3; MI5; MI7; MI10; MI12
	• Can teach students good fishing methods	KI3; KI7; MI6
Teach more on good fishing methods	• Use of light destructive for Chambo fishery	KI1; KI2; KI4; KI6; KI9; KI10; KI11; MI1; MI10; MI 13
	• Dangers of trawl net fishing to Chambo fishery	KI6; KI9; MI3; MI5; MI6; MI13

	• Dangers of using modified gears	MI3; MI8; MI11
	• Students be involved to research on current fishing methods	MI10; MI11; MI13
	• Emphasis on the impact of increased effort	MI1; MI8
Emphasis on regulations	• A lot of fishers use illegal nets to catch Chambo	KI1; KI2; KI3; KI4; KI5; KI6; KI7; KI8; KI9; KI10; KI11; KI12; MI1; MI2; MI3; MI4; MI5; MI6; MI7; MI8; MI9; MI10; MI11; MI12; MI13; MI14; MI15 KI3; KI4; KI5; KI6; KI8;
	• Students need to know the importance of observing regulations	KI10; MI1 MI3; MI4; MI6; MI8; MI9; MI 10; MI11
	• The students need to know the role regulations play to conserve Chambo	MI13
	• The role of Government on regulations	KI2; KI4; KI6; KI9; KI10; MI10
More practice for students in the field	• Students need more time to learn from fishers	KI1; KI5; KI6; KI7; KI8; KI11; KI12; MI1; MI4; MI10; MI11
	• Work with communities in the field	KI2; KI4; KI6; KI7; KI8; KI9; KI10; KI12; MI12
	• Students should practice what they will be doing	KI6; KI7; MI4; MI7; MI8; MI14; MI15
Impact of extension services	• Extension staff work with BVCs frequently	KI3; KI5; KI6; KI12; MI1; MI4; MI6; MI7; MI8; MI11; MI13
	• Extension staff lack practical experiences	KI1; KI3; KI4; KI5; KI7; KI9; KI10; KI11; KI12; MI1; MI2; MI4; MI9; MI10; MI13; MI14; MI15

Abbreviation for the data source

KI = Kela-Makawa interview
MI = Malindi interview
# = Code number given to each interview schedule per area

Appendix 5

Analytic memo focus (AMF) detailing responses from the focus group discussions conducted with fishing communities in Malindi

Summary of the main issues that emerged during the focus group discussions in Malindi. Seven members from the fishing community were randomly selected and the group was composed of fishers, crew members and fish traders.

Table II (AMF) Main issues emerging from the focus group discussions

Category	Brief comments of summary	Respondents
Preference fish	• Chambo is preferred because it attracts more trade than other fish	FGP1
	• Chambo breeds very frequently	FGP2
	• Prefers Chambo because provides enough food at home	FGP3
	• Chambo is profitable fish	FGP3
Fishers to provide lacking skills and knowledge to the college	• Fishers have a lot of skills & knowledge to share	FGP1; FGP3; FGP5
	• Students need to know the importance of closed season	FGP1
	• Students have to know the history of Chambo from fishers	FGP1; FGP4
	• Fishers can teach students fishing methods and impact	FGP1; FGP3; FGP4; FGP5
Teach more on good fishing methods	• Light fishing is destructive to Chambo fish	FGP2; FGP4; FGP5
	• Trawl nets are destructive to Chambo fish	FGP1; FGP3; FGP4
	• Cover more information of the general fishing methods	FGP1; FGP3; FGP4; FGP7
	• Students need to understand the importance of regulations	FGP1; FGP4; FGP6
	• They need to know the	FGP1; FGP4; FGP5

Put more emphasis on regulations	importance of closed season • Importance of enforcing regulations	FGP5
Provide more practical period for students in the field	• Students need to be sent to the field to work with fishers • The students should have three months of practice with fishers • They should be sent to get used to working situations	FGP1; FGP5 FGP2; FGP3 FGP3; FGP5
Impact of extension services	• Extension workers provide out-dated information • Extension workers are not familiar with their work	FGP1; FGP3 FGP2; FGP4
Introducing fisheries courses in primary schools	• There is need to have fisheries courses in primary schools as they are for Agriculture and Health	FGP2
Introduction of wildlife clubs in schools	• You could be visiting schools along the lake shore and introduce wildlife clubs to also discuss fish conservation	FGP2

Abbreviation for the data source

FGP = Focus group person
# = The code number given to the person who was talking at the particular time

Appendix 6

Analytic memo (AMW) detailing responses from the workshops with the fishing communities in areas 2.1 (Kela-Makawa) and 2.2 (Malindi).

Summary of main issues raised in the two workshops conducted in the two research areas. The first workshop had twelve participants and the second one had eight. The participants came from a cross-section of the fishing community that included fishers, fish traders, BVC members and other business people in the area.

Table III (AMW) Main issues from the workshops

Category	Brief summary of comments	Respondents
Preference fish	• Chambo from seine nets	WAG1; WAG2;WBG1; WBG2
	• Chambo from gillnets	WAG3; WBG2
	• Chambo from traps	WBG2
Fishers to provide lacking skills and knowledge to the college	• Fishers to provide the required experiences for the students	WAG1; WAG2; WBG1; WBG2
	• Students to be taught the dangers of the current fishing methods	WAG1; WBG2
	• Fishers, students and lecturers should work together	WAG1; WAG3
Teach more on good fishing methods	• There is need to emphasise on dangers of current practices	WAG1; WAG2; WBG1; WBG2]
	• Light fishing and trawl nets are destructive fishing gears	WAG1; WAG2; WAG3; WBG1; WBG2
Teaching to emphasis on regulations	• Chambo catches have declined due to lack of security	WAG1; WBG1; WBG2;
	• People respected local regulations and had a lot of Chambo	WAG3
	• Fisheries to revise regulations	WBG1
	• Students will get extra	WAG1; WBG1

More practical period for students in the field	knowledge from fishers • Students should get indigenous knowledge from fishers • Students and lecturers should be visiting fishers for more knowledge	 WBG2 WAG1; WAG3; WBG1
Impact of extension services	• Extension staff needs more practical skills • Extension service needs more technical support • Extension service needs to change its approach	WAG1; WAG2; WAG3 WBG1 WAG1; WAG3; WBG2
Introduction of fisheries course in primary schools	• It is important to introduce fisheries courses in primary schools	WBG1

Abbreviation for the data source

WAG = workshop A group ---
WBG = workshop B group ---
# = the code number given to the workshop group

APPENDIX 7

THE USE OF INDIGENOUS KNOWLEDGE TO IMPROVE A LEARNING PROGRAMME IN MALAWI

The action research carried out was to investigate the use of indigenous knowledge to improve the current educational programme that is designed to conserve Chambo fish in the South East Arm of Lake Malawi. For some years there has been an alarming decline of Chambo fish in Lake Malawi and a lot of effort has been put into improving the situation. However the trends have not shown any improvement. Regulations were put in place to respond to the recommendations by a number of research programmes that worked on the fish species. A number of awareness programmes have been running in different areas and districts but the problem still remains unsolved.

My interest in this action research was to see if the current learning programme could be improved by using the knowledge that people have gained through experiences. I chose the South East Arm of the lake where a lot of Chambo used to be caught and are now hardly found. From my experience in the fishing industry, the fishermen are well advanced in fishing technology and this gave me the idea that possibly these people have some skills and experiences that we overlook and that these can assist us in improving the programme we are now using. Looking back at some of the things that the fishing community has contributed to the fishing industry, I saw great potential. For example, they influenced the change in the closed season period for Lake Malombe, one of the big lakes in Malawi.

I worked with two groups of people on the action research and had two people from the District Fisheries Office who work directly with the people in the project area . I chose them to be my critical friends during the process. I also worked with three Beach Village Committees (BVC), an institution put in place by the fishing community to represent the interest of the other fishermen in the area who come from the area of study. The two critical friends were to guide me through the research process and to inform the District Office of what I was doing for administrative purposes.

The action research started with a review of the current educational programme at the district office as well as a review of field reports by the extension officers from different strata within the district. The aim was to see how the current programme on the conservation of Chambo was developed and to determine from the field officers what the progress was. I also wanted to see if I could get some of the views from the user community on the current programme.

I worked with the BVCs in data collection. They went around to a cross section of people in the area (fishermen, crew members, non fishermen, men and women) to find out their view on the current education programme on the conservation of Chambo. We were interested to find out why the decline of Chambo continued although the educational programme had been implemented including regulations and a lot of awareness programmes. We also wanted to learn from the people we were interviewing some of the things that could be looked into for the programme to improve. In order to have some uniformity in data collection, we discussed the guiding questions. Data from the two sources was ready after three weeks and was validated to serve as a true claim of the information collected. We also conducted a planning workshop with the three BVCs we had been working with to decide what type of learning material or learning programme could be developed that would consider the needs of the people in the area. Each cycle went through a planning, action and reflection phase and the issues that emerged from the reflection phase informed the next cycle.

The results from the action research have shown that a number of issues contribute to the non-effectiveness of the current learning programme. The programme was developed by the Fisheries Department using the research, design, disseminate and adopt (RDDA) approach where the user community was seen as an implementing agent without any other ideas to contribute. Many of the areas covered in the learning programme respond to the scientific research findings There has not been any consultation with the user communities to gain experience and skills that could have been integrated into the learning programme.

The failure of the current education programme has mainly been because none of the indigenous knowledge has been taken on board and whatever suggested programme on the conservation of Chambo was seen as a government programme. From the data and oral contributions people made during the action research process, the fishing community has rich experience that, if well utilised, could greatly improve the learning programme. Our education programme created a gap between the user community and the government and has shown the government to be an expert in the management of the fish stocks. This has actually resulted in people deciding to destruct whatever the government suggested to take action on.

It was also found that the user community is aware the government does not know what to do and they see this weakness as an advantage for them to show they have the essential skills and experiences to conserve Chambo. The user community also required feedback on whatever research activity is taking place in the area. They are very proud if involved in the research process as this gives them the chance to voice what they know and is an opportunity to have their views heard.

In the process I have learned that one should involve the user community in a research process and give them the chance to use whatever knowledge they have and make them own the process. If the process needs their effort to implement whatever has been developed, they protect their product and are always interested to see it working. One learns more in an action research if one is prepared to be a learner throughout the process and people are always ready to educate you if they know you want to learn from them. &

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