An Evaluation of the Hirgigo Fishing Training Centre: The Role of Training in Socio-cultural Development of Traditional Fisheries in Eritrea.

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DECLARATION

This dissertation, unless specifically indicated to the contrary, is the author's own work.

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This study has been conducted under the supervision of Ms Christine MacDonald from the School of Sociology and Social Studies, Sociology Department, University of KwaZulu-Natal, Pietermaritzburg, through the authority of the Eritrean Ministry of Marine Resources (EMMR) and the University of Asmara, Eritrea.

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ABSTRACT

In a bid to support the harvesting of marine resources amongst the rural coastal communities and fishing sectors of Eritrea; the traditional fishermen of the coastal and island communities of this country have been involved in formal training regarding their fishing skills.

The training programmes are intended to transfer fishing knowledge to the traditional fishermen of coastal communities and to introduce appropriate basic fishing skills through the Hirgigo Fishing Training Centre (HFTC). This study analyses the perceived role of the fishing training programme in improving fishing activities. The study further evaluates the HFTC programme, from the perspective of its 'traditional fishermen' target audience.

Criteria for the observation and the focal point of the analysis, is to reveal ways in which to best contribute to the development of the fishing villages. This research therefore poses the following question: Is the current training sufficient to develop fishing livelihoods in rural coastal fishing communities, so improving the lives of the people in the fishing villages of Eritrea - or is a greater socio-cultural understanding of the fishing communities required, complimented by subsequent grass-roots development?

In order to answer this question, the study will depend upon the perceptions of key informants and trained fishermen – which are used to examine the impact of the training centre and its programmes. In order to evaluate the HFTC training programme, the study applies a mixture of evaluative social research using the 'naturalistic model' as well as 'Participatory Rural Appraisal' (PRA) research methodologies. The data collection and analysis of the research study is based upon qualitative research methods.

Traditional Eritrean coastal fishing life is based upon traditional knowledge, customs, religion, culture and behavioural experiences that emphasise the flexibility of livelihoods amongst rural shore inhabitants – over many generations. It is suggested

that, as a consequence, the training and development programme faces difficulties in penetrating the inherent characteristics of traditional fishing.

The study shows that while the training programme curricula and instructors' teaching methods are appropriate for the traditional fishermen, they cannot adequately address the everyday constraints experienced by these individuals and their communities. Traditional fishermen are dependent upon multiple livelihoods. While the research participants perceived fishing as a very important way of making a living (as opposed to other livelihoods) they are not willing to rely exclusively on fishing.

This study further shows that Eritrean fishing communities are rooted in traditional attitudes and have unique socio-cultural characteristics. As a research area, the social and cultural milieu of coastal communities is fascinating and requires further social research studies; as does the context of social organisations in coastal and island communities, their indigenous knowledge, culture and ecology. These require special attention to assist rural coastal and island communities and develop academic social and cultural studies.

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ABBREVIATIONS AND GLOSSARY

CCU	Co-operative and Credit Unit
FOA	Food Organization Association
EHRD	Eritrean Human Resources Development
EMMR	Eritrean Ministry of Marine Resources
ISEE	Interkelinjke Stichting Ethiopie/Eritrea
FTD	Fish Technology Department
HFTC	Hirgigo Fishing Training Centre
MoE	Ministry of Education
MMR	Ministry of Marine Resources
MFRRP	Ministry of Fish Resources Rehabilitation Project
NGO	Non Governmental Organization
NRSAO	Northern Red Sea Administration Office
NSD	Nautical Science Department
PRA	Participatory Rural Appraisal
SFRP	Semhar Fisheries Rehabilitation Project
UN	United Nations
UNESCO	United Nations Educational, scientific and cultural organization
WWII	World War Two

Ato:	Mr.
Naib:	The chief
Sambuk:	Traditional wooden boat
Houri:	Traditional wooden boat

CHAPTER ONE

GENERAL INTRODUCTION AND FOCUS OF THE RESEARCH

1.1 Introduction

The focus of this dissertation is an evaluation of the training programme implemented by the Hirgigo Fishing Training Centre (HFTC), to examine its usefulness. The training programme was designed to improve the skills of traditional fishermen in Eritrea, in the context of multiple livelihoods and local knowledge. This research was undertaken in two phases. In the first phase the researcher drew on his previous honours research and personal experience of traditional fishing and other livelihood activities in the coastal zones of Eritrea. Relevant literature together with the previous research, were used to set up the evaluation criteria. In the second phase, the researcher developed criteria to evaluate the training programme from the perspective of training participants and rural fishing villagers. Together, these criteria were used to examine the value of the modern fishing techniques and training - in the context of multiple livelihood and traditional fishing activities.

During the gathering of information concerning the value of the training programme, the majority of study participants included the following: traditional fishermen trained between 1998 and 2002, trainers, training coordinators and untrained fishermen. During this process the study made use of various research methods and research participants.

1.2 Motivation for the study

The inspiration for undertaking this study and the research problem that guided the inquiry resulted from this researcher's honours research project, which explored the characteristics of fisherman-household livelihoods in 'Emberemi' (a coastal village of Eritrea[1]). First, this project showed that the livelihoods in fisherman households of Emberemi are based on culture and tradition, where people have always engaged in utilising their resources through various different livelihood activities. Particularly in fishing activities, there is a systematic division of labour along both gender and age

[1] H. Alamin (2003) 'A Preliminary Investigation into the Importance of Fish for Livelihoods and Perceived Constraints to Increase Fishing Harvest Among Rural Households in Emberemi Village, Eritrea', Honours Research Project, University of Natal, Pietermaritzburg, South Africa.

lines, with correspondingly different role expectations among household members and communities. These livelihoods and roles developed over generations through customary and traditionally oriented knowledge.

The history of relations between traditional inhabitants and the environment (including their knowledge of this environment) are important for understanding natural resource use (Adams, 1992: 48). According to Gupta (1992), the increased literary focus on natural resource use through traditional knowledge is a long overdue development. Gupta (1992) further states that the social and cultural characteristics of fishing communities are increasingly viewed as a valuable and pivotal store of knowledge for socio-economic development. This researcher's honours project (Alamin, 2003) suggested that traditional fishing knowledge was based on cultural and behavioural experiences that emphasised the flexibility of livelihoods amongst rural shore inhabitants.

The other motivation for this study emerged from the perception that training and planned learning programmes can play an important role in traditional fishing societies, by disseminating essential formal fishing skills. In examining the usefulness of the modern fishing skills taught to the traditional fishermen, the point made by Denise *et al* (1989) was borne in mind. They comment that 'assistance in establishing training or action organisations, community planning bodies and co-operatives could aid communities in creating new mechanisms for solving community problems' (Denise *et al.*, 1989: 247).

To this end, the current study presents a conceptual framework which highlights the importance of the modern formal fishing skills for improving, rather than replacing, traditional fishing methods. The framework for this study was developed from the 'human knowledge' (Ruhaman, 2000) perspective. 'Human knowledge' is categorised as both modern and traditional knowledge. For this reason, the 'human knowledge' perspective has significance for more successful development practices. Modern knowledge is crucial for providing basic formal training in fishing skills. Similarly, traditional ways of fishing have their own knowledge and significance. To improve the traditional fishing skills and the lives of the coastal communities, the integration of traditional and modern fishing practices can contribute fundamentally to multiple developments.

1.3 Background of the study

The 30 years of war for independence of Eritrea destroyed much of Eritrea's infrastructure, productive capacity and thousands of lives. Since the independence of Eritrea, the government has established several development programmes in an attempt to improve productive activity and capacity (S. Gemam, 2003 Personal communication)[2].

According to M/Ali (2002)[3], through analysis of the requirements in fishing sectors and villages of Eritrea, a development programme was identified as a way to broaden fishing skills and marine activities. The broader aims of the programme were to create an opportunity to extend and develop the coastal island communities, improve food security and improve the living standards of coastal and inland fishing communities. As part of this, training programmes were designed for traditional fishermen to assist them to upgrade their skills.

These training programmes were to be periodically reviewed and kept up to date with current technical developments. Thus, the government gave priority to educating the rural coastal fishermen through extension programmes and training in basic fishing skills and the organisation of co-operative fishing. According to Gemam (2003), the Hirgigo Fishing Training Centre (HFTC) 11 kilometres southwest of Massawa city, is one example of these interventions. The Hirgigo Fishing Training Centre (HFTC) formally falls under the authority of the Ministry of Marine Resources of Eritrea (MMRE) and was established to transfer modern fishing skills through practically oriented programmes.

Coastal communities are traditionally occupied in multiple livelihood occupations such as, for example, farming, animal husbandry and fishing. Traditional fishing communities are also characterised by mutual support for developing and maintaining strong kinship and clan relationships. Their fishing and other livelihood practices are permeated with traditional knowledge, cultural and traditional beliefs, and are located in a particular lifestyle with specific kinship and religious obligations. The researcher

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[2] S. Gemam, Ministry of Marine Resources (MMR), Department of Fishing Operation, Massawa, Eritrea

[3] M/ Ali, Head of the Human Resources Development (HRD) of the Ministry of Marine Resources (MMR), Massawa, Eritrea

looked at the training programmes designed for the traditional fishermen and their traditional fishing activities with the following broad aims in mind:

1. To explore the relevance of the modern fishing techniques taught in the training programmes.
2. To explore the compatibility of modern training efforts with the culture and norms of the society.
3. To identify constraints faced by the training programmes, in their attempt to penetrate the traditional characteristics and fishing activities of coastal communities.
4. To recommend improvements in the training programmes.

The study developed evaluation criteria from the previous analysis of traditional fishing practices and other livelihood activities of traditional fishermen together with insights from work on indigenous knowledge. This generated the following research questions which were considered from the perspective of the training participants and untrained fishermen:

1. How has the training programme improved their traditional fishing capacity?
2. How has their engagement with other livelihood activities and kinship obligations changed, as a result of the training programme?
3. Has the training had a positive or negative effect on their traditional knowledge fishing practices, and attitudes to fishing as a livelihood activity?

In essence, these research questions aimed to explore the compatibility of the training programme with the social and cultural context of traditional fishing.

The second phase of the study focused on the perceptions of the main target group of participants involved in the training programme between 1998 and 2002. These research questions aimed to explore the more concrete subject of the training programme itself. They were as follows:

1. How relevant is the curriculum of the training programme for the traditional fishermen and their fishing practice?

2. How appropriate are the training methods, resources and language used in training?
3. How appropriate are the teachers involved in the training?
4. How appropriate is the support provided for traditional fishermen after the training?

The perceptions of the trained fishermen played an important role in the evaluation of the Hirigigo Fishing Training Centre's (HFTC) programmes. Hauck *et al* (2002: 463) argued that perceptions represent people's reality and shapes their attitudes and behaviour. Oelofse (1994) cited by Hauck *et al* (2002: 464), pointed out that perceptions are formed not only by the structures of the society, but also by personal history, worldviews and social and cultural context. Nevertheless, these perceptions also need to be reconciled with the reality of the environmental circumstances in which people find themselves as well as with the perception of informed outsiders. For this reason, instructors, administrators and untrained traditional fishermen were also interviewed. The manner in which perceptions are incorporated into management strategies needs to take into account local realities and an understanding of how perceptions are formed (Ibid., 2002).

1.4 Organization of the study

In order to help the researcher, the study began with a literature review in the fields of fishery, anthropology and development studies, as well as in the fields of evaluation and theories of training. The study applies a mixture of 'evaluation research' and qualitative research methodologies discussed further in chapter two. The research study is based on primary and secondary research. It is hoped that this study will clarify the value of the fishing training programmes and provide recommendations for possible solutions to problems that impede the value of the training programmes.

1.5 Overview of the study by chapters

Chapter One: General introduction and focus of the research.

Chapter Two: General background of the study area and the research methodology.

Chapter Three: Theoretical framework of the study.

Chapter Four: Description of the Hirgigo Fishing Training Centre.

Chapter Five: Research findings on the relevance of the curriculum, instructors, training methods and the support after training.

Chapter Six: Analytical discussion of the compatability of the training with the social and cultural context of traditional fishing practices and knowledge.

Chapter Seven: Conclusion and recommendations for the improvement of the training programme.

CHAPTER TWO

GENERAL BACKGROUND OF THE STUDY AREA AND THE RESEARCH METHODOLOGY

2.1 Introduction

This chapter provides a brief description of the research area and research methodology. The general background section briefly discusses the study area and highlights the history of the coastal inhabitants, common features of the coastal region, the fishing sectors and the livelihood activities within the fishing villages. The research methodology section outlines the mixture of approaches utilised, that is, the evaluation research developed from the 'naturalistic model' (Clarke, 1999) and elements from the 'Participatory Rural Appraisal' (PRA) (Chambers, 1994:952) research procedures. The aim of this combination of research methodologies is to explore the perceptions held by training participants of the training programme, while balancing this with the perceptions of the instructors, administrators and untrained fishermen. The aim of including elements of PRA is to enable a deeper analysis of the interviews while also encouraging participants to reflect on their training experience - in order to improve their participation in its design and delivery. This input is then balanced by the perceptions of instructors, administrators and non-fishermen.

2.2 General background of the research area

Eritrea is a country of about 125,000 kilometres^2, situated in the north-eastern part of the African continent. It extends over 1,000 kilometres from Ras Kassar in the north to Ras Dumeira in the south on the strait of Bab-el-Mendeb. Sudan and Ethiopia lie to the west and south of the country respectively; Djibouti to the east, and across the sea are Saudi Arabia and Yemen, as shown in Figure 1. The country comprises a high plateau and a coastal plain. The altitude ranges from the highest mountain, Amba Soira at 3,010 metres in height, to the Danakl depression 100 metres below sea level. The coastal plain consists of semi-arid desert. Off the port of Massawa is the Dahlak archipelago, incorporating more than 300 islands (Longrigg, 1974; Nadel, 1945; Traveski, 1960; Encarta, 1999). According to Vallely (1992) the population of Eritrea is estimated to be 3.5 million with people of many different cultural backgrounds

living in the highlands and lowlands, both settled and nomadic, practicing arable as well as pastoral farming and with roughly equal proportions of supporters of the Christian and Muslim faith (pp: 103).

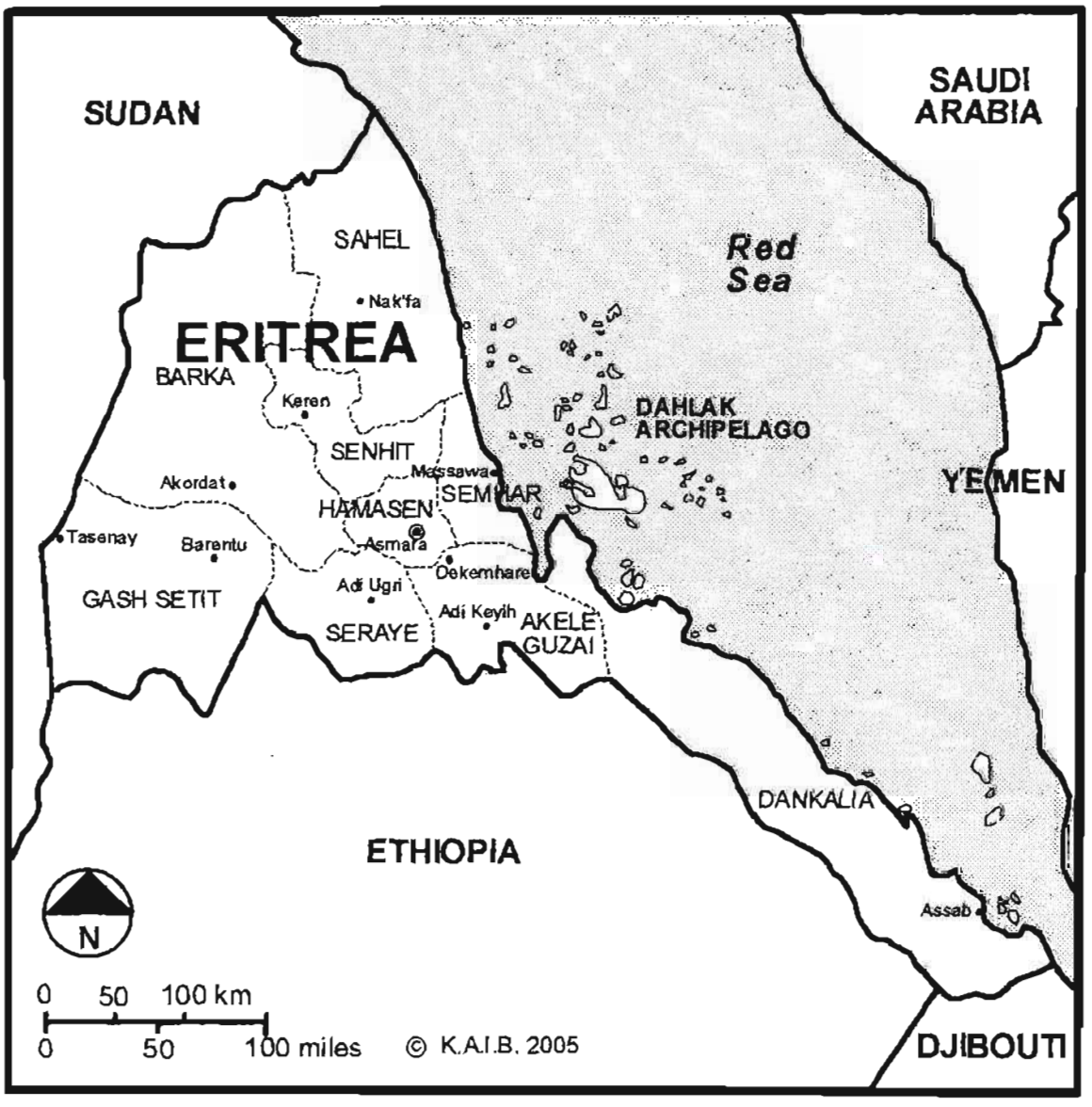

Figure 1: Map of Eritrea showing surrounding countries, region and main towns[1]

There are nine tribes in Eritrea, each with their own language; these are Tigrinya, Tigre, Afar, Nara, Bilen, Hidarb, Kunama, Rashaida, and Saho (Longrigg, 1974; Nadel, 1945; Vallely, 1992; Jordan, 1993).

[1] Adapted from: "Eritrea 1991 -- *A needs assessment study, final report.*" Centre for Development Studies, University of Leeds, August 1992.
http://www.fao.org/docrep/field/003/AB902E/AB902E01.htm#plch1

Eritrea has varied climatic conditions ranging from hot arid temperate to sub humid conditions. Rainfalls of the country are characterized by low and erratic rainfall varying between 200 and 700 mm per year (FAO, 1994). There are two main seasons; the rainy season that prevails from June to September and the dry season from October to May (Rosen, 1998). The coastal plains have rain from December to March. Rosen (1998) states that the highland region enjoys an average temperature of about 16°c, while the lowlands and coastal plains are hot with temperatures rising to 35°c occasionally. According to Haile (2000) the great majority (80% of the population), lives in rural areas including the rural coastal plains.

2.2.1 The coastal and island inhabitants

The Eritrean coastal population can be broken down into four main ethnic tribes; the Afar, Saho, Tigre and the nomadic Rashida tribe scattered in different coastal areas (Saidna, 1998). The Afar tribe makes up 5% of the total population of Eritrea (Pateman, 1990). The Afar tribe inhabits the Dankalia, which is the southern desert coastal lowland of the Red Sea running from Massawa to Assab and Rahaita. This region is 8km from the boarder of Djibouti, and comprises the Southern Red Sea province (Zoba-Debubawi Keih Bahri) and all fishing islands (see Figure 2). The Afar tribe is the largest tribe in the south coast Dankalia (the Southern Red Sea province) and Dahlak islands region (Pateman, 1990; Adam, 1994).

The Saho tribe also makes up 5% of the entire Eritrean population, and is located in south-eastern Semhar namely Afta, Foro and Erafaile. The majority of the Saho tribe live in the eastern edge of the Eritrean plateau and the foothills of south-eastern Akele-Guzai now incorporated in the southern province (Zoba-Debub) (Anonymous, 1944: 4; Farer, 1996; Pool, 1997).

The Tigre tribe is the largest tribe in Eritrea, with 31.4% of the total population (Pateman, 1990). They are settled in the Semhar, Sahel, Barka and Senhit, and include settled cultivators, pastoralists and agro-pasturalist (Anonymous, 1944: 4; Farer, 1996; Pool, 1997; Pateman, 1990). The Tigre tribe is also settled in the offshore and fishing villages found in the coastal areas such as Zula, Hirgigo, Emberemi, Wokiro and in the largest part of the northern coast of the Semhar and Sahel provinces, which comprise the Northern Red Sea province (Zoba Semenawi Keyih Bahri) (Anonymous,

1944: 3; Farer, 1996; ERRA, 1995; Pool, 1997). The Tigre ethnic group lives in geographically fragmented areas and is a highly diversified entity consisting of different tribes and clans with varying historical cultural and customary backgrounds. The Rashida ethnic group is 1 % of the total population and is an Arabic speaking, Muslim, pasturalist community, living mostly in the northern parts of Eritrea (Pool, 1997; Anonymous, 1944: 3; Saidna, 1998).

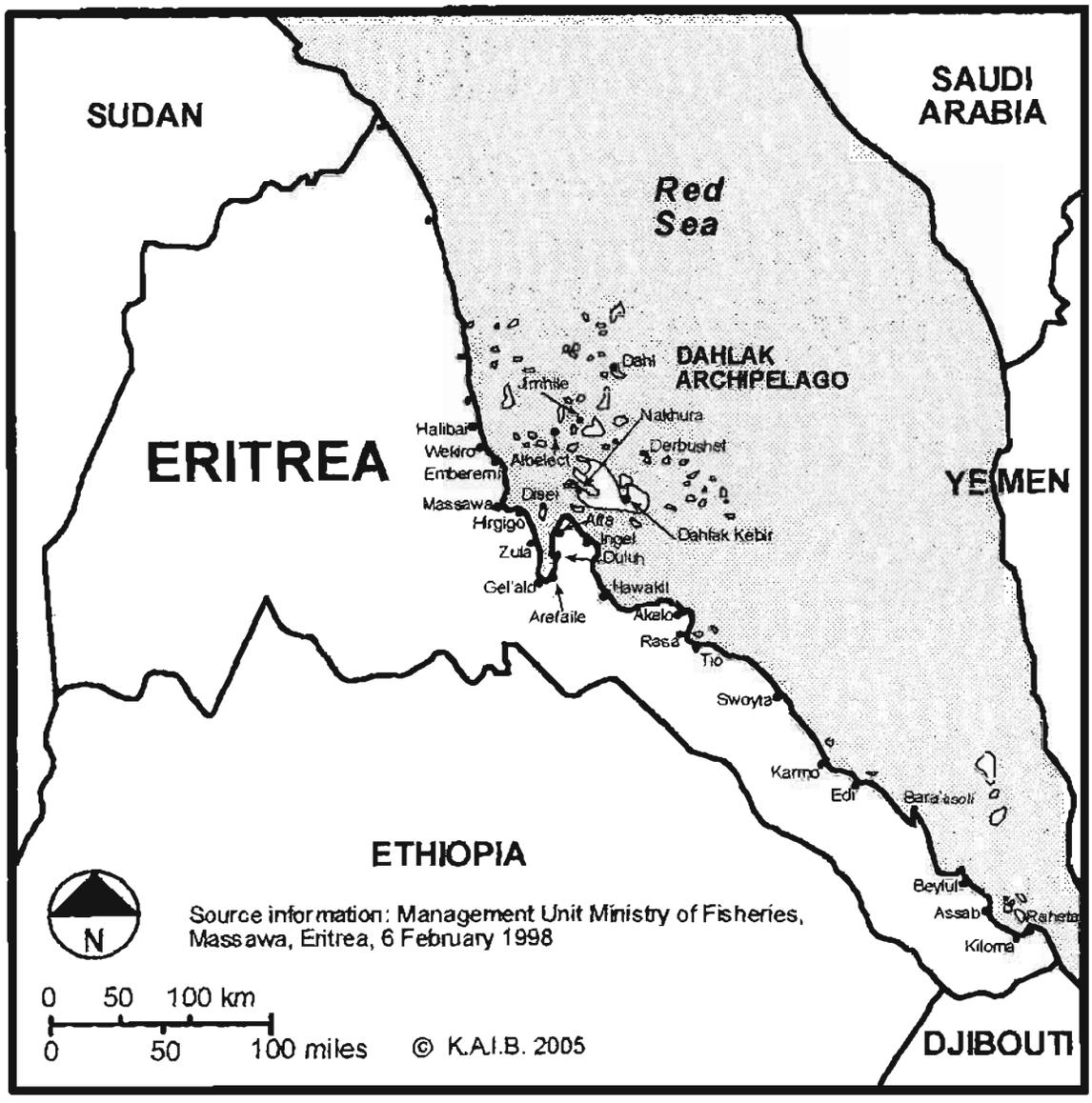

Figure 2: Map of coastal villages and islands of Eritrea[1].

[1] Source Information: Management Unit, Ministry of Fisheries, Massawa Eritrea, 06 February 1998.

2.2.2 Common features of the coastal population

The coastal and islands of Eritrea, are situated in the northeast African and Middle East sub-continents. This can account for the different socio-cultural features of the Eritrean coastal and island people, compared to the other coastal areas of Africa and inland Zones of Eritrea. The location of the country opens it to the influences of other cultures coming across the sea and inland. Through the ages, the Phoenicians, Egyptians, Turks, Arabs, Italians, English, and Ethiopians have all at different times, vied for the land and marine resources of this land in exchange for gold, and other luxury products. Over the decades and centuries, these communities have exchanged their wares and left their imprints on the economic and socio-cultural structures of the coastal communities of Eritrea.

Eritrean coastal ethnic groups share a common religion in Islam. As long as coastal communities share common Islamic rules, everyone's status increases with age and position in religious institutions. This is considered as legalized 'homage' essential for maintaining religious and social practices in a wider social network that spans the whole of the coastal tribes, including other Muslim tribes, residing in a large arc around the highlands, western lowlands, and island zones of Eritrea (Saidna, 1998; Alamin, 2003).

In rural Eritrean coastal (Red Sea) communities, there are a few relatively wealthy individuals (mostly merchants) who enjoy greater social prestige on account of their material luxuries (Alamin, 2003). The less wealthy classes consist of the common fishermen, artisans and farmers. The social network creates linkages with other ethnic groups and societies their own nicknames from long ascending generations, which remain as surnames passed though the male line only, and designated by different types of labour and origins. largely through intermarriages. Amongst the three dominant coastal tribes, families have their own nicknames from long ascending generations which remain as surnames (passed through the male line only) and are designated by different types of labour and origins.

For example, the Ad-Naib ('the chief family') is one of the most popular family nicknames in the Tigre tribe of the north and central Red Sea coastal communities. This was deriving from their role during the colonial rule of Ottoman Empire, and

remains as a nickname for the future generation of the ascendants (Alamin, 2003; Nadel, 1945; Anonymous, 1944).

There are various livelihood activities in the coastal and island villages, dominated by pasturalism, agro-pasturalism and fishing. Crop and animal farming are the important financial activities – with the essential food crop cultivation including wheat, barley, maize, and sorghum. Some of the vegetables that are grown in the coastal communities at a small scale are okra, watermelon, tomatoes, millet and onion, which are useful for both family feeding and trade purposes. Second to farming is fishing, which is again characterized as a subsistence activity and small scale trading in rural coastal and island fishing areas.

2.2.3 The fishing sector

Eritrea's coastline stretches more than 1200 km in length, and has 354 offshore islands, which have themselves a coastline of more than 1200 km. Eritrea has one of the most varied marine morphologies, a valuable asset both in terms of fishing and tourist potential (UNESCO, 1995; Guidicelli, 1984). The south Dahlak islands in particular are well surrounded by mangroves, coral reefs and sea grass. The archipelago ecosystem has a relatively high level of endemism, with 225 of the 1250 species of coral and fish found in this part of the Red Sea being endemic to the region. The coral reefs and mangroves are also important in providing food and shelter to marine organisms (Guidicelli, 1984).

According to Tesfamicheal, *et al* (1999) in the 1950s and 1960s, the Eritrean industrial and traditional fisheries played a major role in the overall economy. Annual catches of over 25 000 tonnes have been recorded in the mid-1950s. Over 80% of this catch was processed into fishmeal and dried fish to be exported to the European and Asian markets. According MMR (1997) in the 1960s however, this production level began to decline, particularly in 1967 due to the Arab–Israeli war and the consequent closure of the Suez Canal. Consequently, the declining trend of production led to eventual collapse as the armed struggle with Ethiopia intensified in the early 1970s. During the struggle for independence, fishermen lost their occupation as a result of the war which stretched to the coastal regions (Soekoejo, 1994). With independence the government of Eritrea has given much attention to the fisheries sector and

provided the fisheries sector and coastal communities with financial support, equipment and training to help the rural fishing communities revive their activities.

Industrial and traditional fisheries are based mostly on capture fishing systems. Industrial fisheries use different types of fishing vessels to catch high quality marine products for commercial purposes (Tesfamichael, *et al* 1999). An industrial fishery focuses on the demersal resources such as the coral and demersal reef shelf fish, and the artisanal fishing activity is focussed on the Plelagic reef and medium large Pelagic reef fishes which are within the capacity of small-scale fisheries (See Appendix C).

Artisanal fishing or traditional fishing is mainly carried out using three types of fishing boats; houries, samboucks and fibreglasses. According to Tesfamichael *et al* (1999) and MMR (1997), houries are divided into two types: those with small outboard engines, and traditional wooden boats with out engines. Houries with engines are 4 to 11m long with 40-horse power (hp) engine. Samboucks are bigger and all of them have inboard diesel engines; they are 12 to 17m long and are traditional Red Sea vessels partly decked (Habteyonnas, 2003). These boats are used for both fishing and trading as their size allows fishermen to fish and easily cross the Red Sea to nearby countries for trading.

The average crew size for houries with engines ranges from 4 to 6 people while samboucks can carry up to 10 people (Tesfamichael *et al* 1999; Habteyonnas, 2003). In coastal and island fishing communities of Eritrea there are a total of fifty seven (57) fishing sites, and among these there are forty three (43) fishing villages that have formed fishing co-operatives (Saidna, 1998).

2.2.4 Multiple livelihood activities

According to Welcomme (1979) most groups of individuals in aquatic areas rely exclusively upon a combination of livelihood activities (pp: 180). The majority of the coastal livelihood activities are farming and fishing supplemented with other minor livelihood activities. Most of the coastal villages and almost all of their inhabitants are familiar with aquatic activities, such as swimming and foot fishing - the proximity of the sea being the key factor here. Yet only those who are involved day-to-day in fishing livelihood activities consider themselves to be fishermen. However, these

fishermen also engage with the seasonal crop growing activities and other such simultaneous tasks. The most demanding fishing and land crop work is performed by young men and husbands heading families. The rest of the family members occupy appropriate work positions according to their age and sex - in both fishing and crop growing activities. For instance, women and children sell a portion of the produce to their villages, a portion which is proportional to the fishing trip yield.
In Eritrea the great majority of people (some 80%) live in rural areas within a farm-based economy. Agriculture, subsistence farming, livestock rearing and fishery are central to the entire economy of Eritrea. The most important food crops are wheat, barley, maize, sorghum and taff (local name). Their success depends heavily upon the seasonal rains, from planting right through to harvest. In Eritrean rural coastal communities each family is obliged to engage in crop growing activities, regardless of other possible livelihood activities (such as fishing).

The seasonal crop cultivation is not promising for the coastal inhabitants. Those who are reliant upon this activity never earn much production due to the sandy soils and scarcity of rain. The arid areas of Africa present difficult environments for agriculture and the success of crops depends largely upon the length and adequacy of the rainy season (Adams, 1992:42). There is no land suitable for modern commercial agriculture. The coastal Eritrean farmers operate primarily on a subsistence basis. .

Livestock production is thus one of the essential activities of the coastal communities. Livestock have been kept by the different communities for centuries and still remain an important sector of Eritrean agriculture (Haile, 1998). According to Haile (1998: pp. 116) livestock forms an important component within the agricultural production systems - with the most common animals being goats and sheep, both mainly used as sources of income) in coastal as well as inland areas.

Furthermore the animals farmed by coastal inhabitants tend to be small in size when compared to other Eritrean areas. Examples include goats, donkeys and camels that are useful for families' food consumption and moving goods. These animals are also irregularly marketed in cities and towns. Generally each and every family in coastal villages has at least a single donkey - for carrying, moving goods and fetching water for the family's use. Bulls are shared to plough farming plots. Those who possess

animals for trading tend to sell male animals. Female animals are generally not sold due to their reproductive significance and milk production. 'The herds have a predominance of female animals, because of the importance of milk rather than meat as the main pastoral product' (Adams, 1992: 49).

These various coastal livelihood activities are shaped primarily by cultural, religious and kinship obligation factors (inherited). The coastal inhabitants are expected to satisfy their communities, relatives or kin, as well as cultural and religious obligations including funeral, marriage, child naming and other such cultural and religious ceremonies. For example: times of departure regarding fishing activities are usually influenced by prayer times; since Muslim individuals are obligated to perform ritual prayer five times per day regardless of their location. This is particularly evident on Fridays, as the prayers must be carried out at the mosque on this day. Muslims are further required to rest during the month of fasting, and are also required to spend cultural and religious holy days with their families and communities.

2.3 Research Methodology

To evaluate the role of the Hirigigo Fishing Training Centre, the research methodology used is combination of evaluation research 'naturalistic model' methodology and elements from 'Participatory Rural Appraisal' (PRA). According to Chambers (1994) 'PRA' research approach is used "to enhance the people's awareness and confidence, and to empower their action" (pp: 954). Evaluation research based on a 'naturalistic model', is concerned with observing, describing, understanding and analysing the nature of social life (Robert *et al* 2003: 210). Lately Guba *et al* (1989) in Schwantdt (2001) explained that the 'naturalistic model shares various methodologies (which) ... have in common a commitment to studying human action in some setting that is not contrived, manipulated or fashioned by the inquirer' (pp: 173-4). Pido (1996) developed a quick diagnostic tool to evaluate the operation of both formal and informal fisheries management systems ('Rapid Appraisal of Fisheries Management System' (RAFMS)). Therefore, from the Pido's ideas, the researcher motivated to use the qualitative and descriptive approaches to collect and analysis data in the evaluative process related to rural coastal community development approaches.

Qualitative research appeared to be the most appropriate paradigm for the data collection and analysis in the present study, as it is directly concerned with experience as it is lived. The focus of the qualitative research is on the depth and the quality of the peoples' reported experience, and not on the number of people who respond in a particular way (Stake, 1990 in Miller *et.al.* 1994). According to Miller, *et.al.*(1994), "qualitative research then has its aim of understanding experience as near as possible to how its participants live it" (pp. 14).

Participatory research approaches and methods are often referred to as 'popular participation' and 'participatory rural appraisal', or 'PRA' (Chambers 1994). In essence, this approach invites a high degree of participation and collaboration between the researcher, fishery officials, trainers, trained and untrained fishermen through every stage of the research project. The research methods used in the participatory approach also help to ensure a high level of participation of informants in the study.

The participatory approach emphasises a development-driven process with community-oriented methods of research. So participation, which allows communities to define problems and solutions, is important (Pratt and Loizos, 1992). Particularly, the evaluation research study will help participants to understand how the fishing training centre is designed, as well as how the evaluation research is conducted, interpreted, and subsequently utilised. According to Chambers (1994) the essence of PRA is that the research process changes and exposes the role and behaviour of the training participants, their relationships and the training processes. Its purpose is to gain an understanding of the complexities of the social research area through respondent participation.

The main features of PRA, as described by Theis and Grady (1991), that were applied in this study included: First, a multidisciplinary approach, this was adopted to include socio-cultural information together with the data from the fishing training process, in order to produce an integrated understanding of all relevant issues at play in forming the rural fishing communities and their relationship with the environment. Second, considering the nature of the study it was important to allow people to contribute and participate by suggesting ideas and problems rather than only applying the researcher's opinions and ideas. Third, flexibility and informality were used, as when

dealing with social research it is best to get people to relax and express their perceptions. It was important that the techniques used remained flexible when dealing with rural fishing training participants.

2.3.1 Data collection

In the participatory and qualitative research approaches the data collection techniques were a useful tool as they allowed people to respond formally, as well as informally, to the questions asked. According to Dickson (1995), social research requires that the researcher be a flexible instrument by becoming personally and subjectively involved with the research participants, while constantly monitoring their own behaviour to minimise bias and subjectivity. At the very least, these data collection methods can be a valuable means for rapidly promoting rapport between the researcher, fishery officials and fishing people; at best they may be an effective way to promote more success in the study. To evaluate the fishing training project the participatory approach might help the researcher to obtain better information from training participants. And qualitative approaches are helpful to interpret and understand the data effectively.

Guba and Lincoln (1989) in Clarke (1999: 58) argued that some of the evaluators combine naturalistic components such as participant observation with repeated formal structured in-depth interviews to create a mixed method design. Babbie (1992) also suggests using more than one research method of data collection minimise the bias of the researcher and can be effectively used in formulating, planning and implementing the evaluation research processes.

Therefore, this evaluation research study used qualitative data collection method includes structured, in-depth interviews and observations data method to allow the researcher to study the topic in depth, openness and detail. The use of the structured interview afforded the researcher a greater chance to establish rapport from the training participants and to collect their in-depth daily experiences, personal narratives, and social background. Structured interviews were used in this study with open-ended questions and asked face-to-face to enable the trainers and training coordinators to express their own experiences and feelings about the training programme. Observation as a means of data collection was essential for identifying

the significance of the training processes that traditional fishermen were involved in, and the nature of the traditional fishermen's lives on the fishing docks and in traditional fishing cooperatives, after the training.

The researcher's honours research work included direct structured interviews, focus groups and observation of the fishing practices to produce a sketch of the social setting, social characteristics, and fishermen's attitudes towards various livelihood activities. This was helpful for enabling the researcher to go beyond the structured interview schedules (as they appear in the appendix) to have in-depth interviews within structured interviews and the observation data collection methods in the present study. The interview schedules were focused on understanding the importance of the training programmes for training participants.

2.3.1.1 Interviews

Interviews have been widely used in social research, as they are believed to convey a deeper feeling for, or more emotional closeness to, the persons studied (Cupchik, 2001). The present study conducted interviews with administrators, trainers, trained, and untrained traditional fishermen. The interviewing of the various stakeholders was guided by Patton's perception that the purpose of interviewing is not to put things into someone's mind, but rather to understand the perspective of the person being interviewed (1982:161 in Nxumalo, 1999: 32) and to collect as much in-depth data as the researcher can. This approach was necessary to understand, in a short time, how the various informants perceived the role and value of the training and their cultural background. There were two phases to the interview processes, with the second using more structured interviews.

Bless *et al* (1995: 107) argued that a scheduled structured interview is conducted in a case when there is a need for more specific and detailed information, which can facilitate comparison of the reactions of different participants. The types of interview questions that were prepared for the sample of administrators and trainers of the HFTC were generally quite fixed. Interviews with trained and untrained traditional fishermen were more semi structured. This allowed questions for specific and detained information while also enabling the resources to probe the participants for more in-depth responses.

2.3.1.2 Interview schedule

Before the researcher conducted the interview, he asked respondents if they were willing to participate[1]. The interviews took place with the individual trained fishermen respondents being face-to-face, and incorporated open and close-ended questions. The interview schedule was perhaps more structured than qualitative research should be but this was necessary because of time constraints. Research conducted during the researcher's honours year enabled him to develop greater depth in the analysis and interviews than would otherwise have been possible. The semi-structured interview scheduled also ensured that more concrete evaluation criteria could be systematically explored. The interview was designed as follows:

A respondent was asked all questions[2]. These questions were hoped to result in answers that reflected respondents' socio-cultural background and their experiences and perceptions of the training programme. The interview schedule sheet was used to record respondents' answers exactly as they were stated. The purpose of this was to make it flexible enough to express what perceptions they might have about other related discussions, while at the same time structured enough for the researcher to easily collate the responses for data analysis.

The main purpose of these interviews was to explore the trained fishermen's perceptions and link these to the responses given by the training programme administrators and trainers - who tried to reflect experiences of the trained fishermen and what they perceived to be the purpose of the training programme, as well as the strengths and the weakness of the programme. The major research questions addressed through the structured questions were: How relevant are the curricula of the training programmes? How appropriate were the training methods, language and teachers used in the training? How appropriate was the support provided for traditional fishermen after the training?

The more open-ended questions explored the socio-cultural background of the respondents and also assisted in analysing and exploring the following research questions: How has the traditional fishing capacity improved? How has the

[1] For the letter requesting participation in the research, see Appendix A
[2] For the interview questions, see Appendix B

engagement of traditional fishermen with other livelihood activities and kinship obligations changed? How have the attitudes to fishing as a livelihood activity changed as a result of the training? What positive or negative effect has the training had on traditional knowledge and fishing practices?

The second phase of the more structured interviews was conducted with various stakeholders during a single week, on consecutive days. The succession of the interviews was guided by the sequence of the units of the training programme. This means that the first interviews were conducted with administrators of different departments of the MMR. The interview schedule included questions about the background of the training centre, the curricula, the situation of the trainers and trainees, and the development programmes in which the training was situated. During the interviews with the various stakeholders, the researcher used a tape-recorder as a tool for recording the responses of the interviewees. Tape recording was the main techniques used to record data. This is a technique, which the researcher found useful in helping him to be more attentive to the interviewee.

Following interviews with the administrators, subsequent interviews were carried out with trainers of the HFTC. The interview questions focussed on exploring details about the training programmes and about the trainees during their training. There was a natural flow of interaction between the interviewer and the interviewees during the interview session.

The next interviews were carried out with untrained fishermen who were not involved in the fishing training programme. This was done for the purpose of exploring perceptions of the trained fishermen held by their communities and exploring the social and cultural characteristics of the fishing communities. Finally the researcher selected trained traditional fishermen for interviews from the same group sampled for the initial interviews. These interviews were conducted to revisit questions raised in the initial interviews and to probe for additional information.

2.3.1.3 Observation

Mouton (1996:156) argues that the "... first general principles in data collection are that the inclusion of multiple sources of data in a research project is likely to increase

the reliability of observation" and Bless et al point out that "...observation is a useful tool for personal direct evidence" (Bless *et al*, 1995:109). The purposes of observation are primarily to add naturalistic depth to the interview data and to provide an internal validity check from a second source of ethnographic data for corroboration (Bless, *et al* 1995:109). The present study employed observation in order to explore training materials, teaching methods and practices in the training centre, as well as the trained fishermen's position after the training. Various degrees of participation are associated with observations.

For example, observations were done in the training centre, where the research looked at its facilities, such as classrooms, bedrooms, teaching and demonstration materials. Observation was also done in the cooperatives surrounding Massawa where traditional fishermen were located, and at the MMR fishing harbour. The purpose of this was to look at how the fishermen applied the training programme in their various daily activities from fish catching and handling to boat handling, in both harbours and market places. Observation was important in cases when interviewees were unable to express their feelings by direct questioning, and for highlighting issues overlooked by the researcher in the interviews. This process was improved through extensive note taking by the researcher.

2.3.2 Research sampling

The present study attempted to look at various data sources to consider the study from various stakeholders' viewpoints. Therefore trained, untrained traditional fishermen, trainers, and training administrators were involved. The purpose of involving various stakeholders as data sources is adopted from Stake (1975) "who advocated a naturalistic approach in the processes of data collection in the evaluation process". This approach further stresses the importance of involvement of different stakeholders in the evaluation situation, on the grounds that "different stakeholders may have different claims, concerns, and issues... it is the task of the evaluators to ferret these out and to address them in an evaluation" (cited in Guba and Lincoln, 1989:40).

A total of 41 people participated in this study. Out of the total 41, 30 were fishermen who took a short-term course in the Hirgigo Fishing Training Centre between 1998 and 2002. These 30 trained fishermen were chosen to explore their perceptions of the

value of the courses and to identify the ability of the trainers and the role of the training centre. These 30 trained traditional fishermen were randomly selected from a list of 200 trained fishermen provided by the HFTC. Out of the total 41, 5 fishermen who were not involved in the training programme were selected to explore their perceptions of the value of the training. Snowball sampling among fishermen at the fishing harbour of Massawa was used to select these 5 untrained traditional fishermen. The research sample also included 3 administrators of different departments of the Ministry of Marine Resources who planned and designed the training programme and 3 trainers who were involved in instructing in the training centre. The instructors were chosen to describe the fishing training programme and the background of traditional fishermen trainees.

The purpose of including the various stakeholders mentioned above, was to discover detailed information about the training centre, programme strategies and methods used in the development of the training programme and training participants. This included the knowledge and principles which informed the planning and design of the programme as a whole - development of the training materials, the teaching strategies, and modes of assessment used to evaluate the progress of the trainees towards the achievement of expected outcomes.

Sampled unit	**Total number in sample**	**Interview phase**	
		Phase I	**Phase II**
Trained fishermen	30	30	5[1]
Untrained fishermen	5		5
Administrators	3		3
Trainers	3		3

Table 1. Sample selected from the Ministry Marine Resources Authority and fishermen wards for interview in the 2 phases of interviews.

[1] These five participants were also interviewed in the 1st phase of the interviews.

2.3.3. Ethics of the study

Before the researcher began the interviews, each potential participant was asked if he would be willing to participate in the study. The researcher gave clear instruction that he would use the information for academic purpose only (see Appendix A). The researcher kept confidential the identity of the trained and untrained traditional fishermen in order to enable them to freely express their perceptions of the training programme and their social and cultural context. The purpose of this is clearly given by Mouton in his argument that "... one possible strategy to reduce the effect of sensitive behaviour ...in situations where subjects tend to be unusually reluctant or unwilling to participate because they regard the investigation as an invasion of their privacy, would be to emphasis the anonymity of the responses" (1996:157). Furthermore, the researcher asked for permission from the participants to use the tape recorder while interviewing.

2.3.4. Data analysis

For reason discussed above, aspects of the data could have been used for quantitative as well as qualitative analysis. While the sample was too small to extrapolate quantitative analysis to the research population, the data appropriate for quantitative analysis was still very useful for indicating the extent of the commonality in the participants' perceptions.

In accordance with the overall design of the research, qualitative data analysis techniques were used. The interpretation of the data was mainly based on inductive analysis and interpretation. Inductive analysis was employed to highlight the themes that emerged out of an intensive reading of the data rather than these themes being imposed prior to data collection and analysis. The data is analysed and discussed in chapters 5 and 6.

CHAPTER THREE

THEORETICAL FRAMEWORK

3.1 Introduction

The concepts used to describe and analyse this study are derived from theories of knowledge. This approach was useful to understand the socio-cultural characteristics of the rural coastal communities and how to improve crucial areas, such as fishing, in innovative, practical ways. The framework of this study developed from the 'human knowledge' perspective (Ruhman, 2000), which is emerging as a synthesis of sociological, anthropological and developmental studies. The model deals with human knowledge, and endeavours to combine scientific and traditional knowledge to show how knowledge can benefit rural coastal communities. This model is preferred as in this study it was important to consider the compatibility of scientific training and the traditional knowledge of rural coastal fishing communities. Traditional social organisations, customs, traditional knowledge and technology are inseparable from traditional fishing and other economic activities. Thus, these features make the study suitable for anthropological and sociological approaches. On the other hand, the study also explores the usefulness of formal modern training in terms of the resources of scientific knowledge, the appropriateness of training arrangements, and attempts to adopt new fishing skills and techniques though instructing and facilitating access to education and training.

3.2 Theoretical concepts

'Human knowledge' emphasises the combination of scientific and traditional knowledge. Ruhamn (2000) explains that the study of 'human knowledge', as human history itself, has been a central subject matter of philosophy and epistemology since the Greek period. Knowledge has begun to gain a new wave of attention in recent years. This has resulted in fresh approaches to, and ways of, analysing development - such as considering human and economic development over time. As well as understanding the social and cultural features of rural fishermen, this approach could highlight elementary developments which can improve the way of life in these areas. This calls our attention to the importance of knowledge.

Roe (1999) mentioned that the flux of development could occur due to the spatial and temporal heterogeneity of human knowledge, and it can be a result of the degree of access and utility of development goals. Ruhman (2000) classified human knowledge into two types of systems i.e. formal scientific knowledge and traditional knowledge. The main difference between these two kinds of knowledge is their format. For instance, scientific knowledge is essentially in an explicit format that can be articulated in formal language including grammatical statements, mathematical expressions, specifications manuals, training and so forth (Ruhman, 2000). Thus, this kind of knowledge can be transmitted across individuals formally and conveniently. This has been the dominant mode of knowledge of western scientific philosophy. However, the format of traditional system is tacit – that is, hard to articulate with formal language. Traditional knowledge is embedded in the experiences of indigenous or local people and involves intangible factors, including their beliefs, perspectives and value systems.

Much of the scientific knowledge that already exists in advanced societies is yet to be diffused to the rest of the world. In other respects, the existing knowledge base is inadequate to the tasks confronting traditional knowledge. The diffusion of scientific knowledge though science and technology are driving forces of modern development and global economic integration. But the harnessing of scientific knowledge and modern fishing training programmes for the betterment of society has been extremely uneven in traditional fishing societies.

According to Harrison (2002) the main conception of knowledge in contemporary discourses, emphasises that adult learning and training are vital to diffuse scientific knowledge (pp: 1). This is viewed as an essential strategy for successful negotiation of life courses and the improvement of adults and youth in rural fishing communities; "... 'life long learning' presently represents the epistemology of knowledge" (Harrison, 2002). Since knowledge is a key resource to contribute to social and economic development, adult learning and training are identified as the main techniques of diffusing knowledge and facilitating participation of all communities in development (ibid, 2002:2).

The commonly accepted distinction between formal and informal learning is between

different institutional contexts in which learning occurs. In advanced societies learning might occur in the workplace, the home, the college and/or training centres (ibid, 2002). In traditional societies learning might occur through 'learning by doing' or through traditional oral presentation. Each form of knowledge has its own outlook (Boserup, 1995). From a scientific perspective, training is viewed as the transfer of new fishing techniques in well designed programmes to improve fishing methods, eliminate the constraints to fishing and maximize returns to rural coastal fishing communities. In traditional knowledge, training is viewed as the transfer through oral exchange of knowledge about fishing methods gained from past experience, and associated with the day-to-day activities, custom and attitudes in a specific environment and specific group (ibid, 1995).

Wherever it is gained, knowledge is valuable for addressing a person's basic needs, developing life experience and enhancing the activities available to that person. This research aims to explore the compatibility between scientific knowledge (as reflected in the formal fishing training courses) and traditional knowledge, as it is expressed through the intangible aspects of every-day life including the beliefs, perspectives, value systems and practices of traditional fishermen. This research will also draw on approaches to adult education, to explore the relevance and appropriateness of the fishing training curricula and the training methods used in the courses.

3.2.1 Fishermen's traditional knowledge

Many definitions have been proposed for traditional knowledge systems, but all of them are incomplete because the concept is relatively new and still evolving (Johnson, 1992; McCorkle 1994; Bekers and Henley 1997). According to Ruhman '...the literature in related fields uses various terms interchangeably to designate the concept of traditional knowledge, such as traditional ecological knowledge, local management system knowledge, indigenous knowledge, community knowledge, rural peoples' knowledge and farmers knowledge' (2000). While certain distinctions can be made, these terms often refer to the same idea (Chambers, 1997; Warren 1990; Mathias 1994; Roach 1994; Agarwal 1996; Lawas and Luning, 1997).

To summarize the definitions, the term "traditional knowledge" mainly denotes a tacit type of knowledge that has evolved within the local grassroots of the community and

has been passed on from one generation to another. According to Agarwal (1996) the knowledge of the rural coastal communities does not encompass only local traditional knowledge, but also scientific and other knowledge gained from outsiders through formal mechanisms. Today traditional knowledge systems are seen as pivotal in discussions on social and economic development in different countries (Brokensha *et al.* 1980; Compton 1989; Warren 1990; Gupta 1992), as well in cultural development. In most countries traditional fishing livelihood activities are increasingly regarded as a precious national resource, due to their role as a repository of traditional knowledge.

To generalize, the Eritrean traditional fishing knowledge and interaction in traditional fishing is located in specific islands and rural coastal villages. According to Sefir-Younis *et.al* (1985) this can be described as a decentralized and scattered pattern of fishing communities and the use of relatively simple traditional fishing methods. To view the traditional fishermen's knowledge as defining traditional fishing is important (Tvedten et al, 1992 in Habteyonnas et al, 2003). Eritrean traditional fishery is not characterised by small-scale fishery alone; with Smith (1979) stating that '...fishermen normally carrying out small-scale fishing, which often consists of kin groups using small boats' (pp: 3). Eritrean coastal inhabitants posses their own social organisations, language, customs and religious beliefs, and their social activities typically overlap with livelihood activities such as agriculture, animal husbandry, and so forth (Tvedten et al, 1992 in Habteyonnas et al, 2003). Eritrean traditional fisheries are further characterized by their own social organisations, language, customs and religious beliefs. These typically include agriculture, animal husbandry, and other non-fishing activities.

Most of their fishing methods are based on culture, experience, locally available technology and knowledge gradually constructed and passed on from generation to generation. Flexibility amongst rural shore inhabitants involves the use of a full range of environmental resources open to them - both land and water resources (Alamin, 2003). Dewes (1993: 3) argued that traditional fishing knowledge is related to the entire culture of a people, including identity and spiritual and religious beliefs (in Kolawole 2001). For example, in Emberemi village in Eritrea, fishing practices manage to accommodate social and religious obligations, as well as other livelihood activities. Fishing practices are clearly affected through the constraints imposed by

these other commitments. Fishermen attempt to reduce fishing-related behaviour that is perceived negatively by their community, for example long fishing trips and frequent fishing work at night. Emberemi fishermen also divert their energy to meeting social and religious obligations (and planting and harvesting), even when these activities coincide with good fishing conditions. According to Adams (1992), traditional fishing activities are flexible - an important feature of traditional fishermen's interaction with the nature – where their relationship with their environment and seasonality provides evidence of this flexibility over long periods of time (pp: 49). Knowledge of the environment, environmental change and landscape is a vital element in the success of strategies (Ibid. 1992:48) in fishing, farming and pastoral activities of rural coastal communities.

3.2.2 Scientific knowledge

Blaikie (1995, 213) writes: "Academic and scientific institutions produce framings and facts which reflect their cultures, and their systems of rewards for professional excellence". In contemporary times the term 'training' is recognized as the best investment for long-term economic and social development. Katz *et al* (1980) defined 'training' as the process of change in a group of the society through planned learning. According to Katz *et al* (1980) training is an essential component to increase knowledge and skills for future developments and through practical application for endorsement to change the knowledge and skills of people. In scientific knowledge, to teach or train is an obvious solution to achieve developmental goals; for this reason scientific knowledge training should be a key feature to improve individual and community development.

In fishing, training may play a role in upgrading rural fishing communities through transferring basic and new fishing skills; and as a maintenance subsystem intended to improve technological efficiency and increase the stability of fishing communities. Providing training to such traditional fishermen might furnish new ideas of techniques and approaches to use in the future. Panayotu (1982:2) defines fishery development as the expansion of effective effort through a set of assistance programmes to achieve certain objectives such as increasing the exploitation of under utilized stocks through allocation of additional labour and capital, technology upgrading and training.

Training is a fundamental need not only for modernizing the fishery economy but also for the development of people in coastal communities (Kuhnen, 1982: 100). According to Kuhnen, (1982) training should include open access to the sea so that fishing skills and knowledge can be acquired. Furthermore, training in the fields of nutrition, management and co-operatives could build the knowledge and skills of coastal communities in maintaining and repairing implements, with particular attention to using local materials (pp: 100-101).

According to Rothwell *et al* (1989) proper teaching methods have direct implications for trainees and professionals involved in the training, of marine resource users and development of fishing technology (pp: 16-17). Training in fishing skills may be defined as the process that provides individuals with an organised series of events, experiences, and materials that comprise opportunities to learn fishing skills to improve fishermen's fishing activities and the standard life of the rural coastal communities. Considering this definition, it is anticipated that the trainee fishermen will gain knowledge, experience and skill related to their fishing knowledge background. From the scientific perspective 'training' is a form of changing and planned learning in organisations that is important for realising tactical production. Rothwell *et al* (1989: 1) argued that, this is necessary so that all employees learn to anticipate and respond to rapid changes in their jobs, careers, workgroups and organisations. According to Pollnac (1985) rural fishing activities provide individuals otherwise lacking knowledge or skills, with structured opportunities to receive the fruits of skilled organizational experience (pp: 260). Human development can contribute to this learning through organised training, education and development for expected future needs (Rothwell *et al* 1989:1).

3.3 Why the need for integrating scientific and traditional knowledge?

According to Kolawole, (2001) most coastal societies and rural fishing communities are involved in traditional fishing activity for subsistence. The social and cultural characteristics of the fishing communities are also vital gears for rural survival (Landis, 1940). According to Kurien *et al* (1982) the social and cultural characteristics of traditional fishermen are related to the need for flexible activities and the local

history, environment and resources. The social and cultural characteristics of the traditional fishing knowledge are perceived as means of resolving certain development problems (Kolawole, 2001).

Dewes (1993) in Kolawole (2001) argues that the knowledge of local people is an enabling component of development. He compares indigenous knowledge to the feathers of a bird, since 'a bird can only fly if it has feathers'. The terms 'indigenous knowledge' and 'local knowledge' are synonymous. However, what development experts may object to is the use of 'traditional' to qualify the knowledge peculiar to a people, since in some circles 'traditional' evokes 19th-century conceptions of 'simple, savage and static societies' (Dewes, 1993 in Kolawole, 2001).

Most fishery development programmes, whether they are artisanal or industrial in nature, comprise both scientific as well as traditional settings. Scientific knowledge and its characteristic are dominant in any development arrangements including fishery development programmes. This has often involved mutually exclusive goals to increase export supply, markets, income, training, employment, as well as social and cultural development opportunities in fishing sectors and fishing communities. Scientific and modern development activities frequently included revising the traditional fisheries. For people who live by tradition and folklore, change involves risk; they trust what has been tried and tested by long-established custom (Landis 1940). So that means, the contradictory idea of the 'traditional', at the grass root level has to be tested and proved useful under local socio-cultural conditions whether the scientific knowledge system is recognized or not. According to Pollnac (1985) socio-cultural characteristics of rural fishing communities face various difficulties and their impacts are viewed as the main reasons for poorly developed fishing sectors. This generates complications for coastal communities, as training needs to be relevant to the educational background and productive activities of traditional fishermen (pp: 263).

The integration of modern and traditional knowledge is essential to give development worker or trainers' a thorough understanding of the social and cultural characteristics in which livelihood activities are located. Only then can the livelihood activities and economic futures of such traditional marine resource users be improved. The concepts of development held by different people vary considerably. For the rich it

might be industrialization, while for the poor it often is social improvements such as training and improved fishing methods as well as nutrition. Development should meet primarily, the needs of the society concerned and not just external actors. There is evidence of development projects that have failed because of these reasons. This is because many of the projects were focused on societies rich in natural resources, where at the end the primary benefactors were external investors (Etziony, 1988). Baliey (1988) argued that normally a development project is capital intensive rather than labour intensive. For instance, many of the fisheries project implementers use the concept 'development' just to exploit resources; these exploiters either give false hope to rural people or restrict fishing groups to those who have their legal permission.

Aspects of human knowledge such as past experience and training orientation, influences socio-cultural development and socio-cultural orientations influence development (Emmerson, 1980). Socio-cultural factors position people in relation to each other and in relation to a societal norm (Emmerson, 1980). The integration of scientific and traditional knowledge is essential for socio-cultural development as knowledge is in itself a fundamental process of development; a particular way of going about communal affairs. Emmerson (1980) argues that social and cultural development has meaning for people as they can only survive with ways that are relevant and meaningful (pp: 27). For example, this approach shows how important the social and cultural norms of sharing and exchanging are – being those that typically govern the sharing of the catch in subsistence fisheries, and how rapidly those norms deteriorate when fishery is mechanized and commercialised (Emmerson 1980:28).

Understanding the socio-cultural characteristics of the rural fishing communities and through this, development, requires analytical abilities in policy makers and the readiness of rural fishing communities to improve their fishing livelihoods. These analytical abilities can provide the space for consideration of social and cultural features and how these can be applied in policy and public action. Including social and cultural features as factors in shaping development policy may suggest that it is not so much what we do, but how we do it that matters. In other words the most obvious objective in many fisheries development projects, is often expressed in terms of fish harvest growth and production-oriented strategies. Especially in developing

countries, fishery development deals with resource conservation and physical yield maximization, the economic objective of profit maximization and the political objectives concerned with employment and equity (Etziony, 1988). In practice however it is not possible to achieve all the objectives simultaneously. Even though each of these goals are important, they can be mutually exclusive, for instance, yield maximization necessarily requires high or so-called advanced technologies or large vessels equipped with monster trawlers. People who live in poor communities will not fit in with this change, as they will not be able to afford to buy and maintain fishing boats and gears. It may also disrupt their way of life. Etziony (1988) points out with regard to fisheries, depending on the biological and economic circumstances some goals might be less relevant or urgent to rural coastal communities than other goals. Nevertheless, these goals compete with each other and are often incompatible in a fisheries development scenario, requiring hard choices to be made. Most development analysts satisfy themselves with studying outcomes, and managers commonly have to choose what is most important to them, or how to balance the different objectives in an acceptable manner.

For these reasons Roe (1999) argues that the integration of scientific and traditional knowledge is essential for development goals. Most traditional fishing communities believe in their methods and traditional knowledge of fishing. Introducing modern development systems and training can result in resistance form local communities. These are then seen as drastic rural development project failures, because those projects are not explicitly initiated into the social and cultural lives of the fishing communities (Ponte 1998; Jansen *et al.* 1999; Owino 1999). All too often, we can find that training has been successful in that the traditional fishers learn, but unfortunately, the training does not necessarily change the behaviour of the trainees. This state of affairs is by no means due to the trainee's failure to learn. He does learn. He does not, however, necessarily apply the knowledge acquired. To achieve the latter, the training programmes must be viewed by the trainees as relevant and appropriate to local circumstances.

CHAPTER FOUR

THE HIRGIGO FISHING TRAINING CENTRE

4.1. Introduction

The fisheries sector has tremendous economic potential for the country. Proper fishing techniques are important to exploit the resources as needed. However, fishing and other related activities require skilled manpower. In the coastal Northern and Southern Red Sea Zones (ECNSRSZ) of Eritrea, the Hirgigo Fishing Training Centre (HFTC) is the only running fishing training centre mandated by the Ministry of Marine Resource (MMR). Its responsibility is to transfer fishing technology in order to upgrade the rural coastal fishing villages and other fishing sectors. The information on physical characteristics of the HFTC was gathered through interviewing various administrators of different departments of the MMR, the trainers of the HFTC and from the Ministry's annual reports and other documents.

4.2. Approach to training and the fishing training policy in Eritrea

According to the Ministry of Marine Resources (MMR) (2000:10) training is defined as: 'the process that provides individuals with an organized series of events, experience and materials that comprises opportunities to learn. As per definition, it is anticipated that the trained fisheries personnel will gain changes in their behavioural patterns and attitudes, and hence improve their quality of work, increase knowledge, experience and skill'.

According to M/ Ali[1] (2003) the training policy of the MMR lies within the overall Eritrean government training policy outlined by the Ministry of Education in March 1997. The policy outlines the importance of education in the development of Eritrea's human resources. It indicates the objectives of education to achieve central goals as follows:

- To produce a population equipped with the necessary skills, knowledge and culture of a self reliant and modern economy.
- To develop self-consciousness and self-motivation in the population to fight poverty, disease and all the attendant causes of backwardness and ignorance.

[1] Interviewee, Head of Human Resources Development (HRD) of MMR

- To make basic education available for all.

These goals are evident in its objectives for education-related policies, which are identified as follows:

- The promotion of equal opportunity in terms of access, equity, relevance and continuity of education for all school-aged children.
- The provision of education in the medium of the mother tongue at the primary level and in English medium at the secondary level.
- Encouragement of the provision of education by the private sector.
- The provision of continuing education through formal and non-formal channels to achieve a more literate and skilled population.
- The meeting of skilled manpower requirements, with emphasis on imparting of multi-craft skills by a steady increase in enrolments in secondary technical and vocational schools.
- The development of culture, arts and sports with the active participation of the community.
- The sharing of the costs of education between the government, community and parents.

These policy objectives have been translated into programmes for various stages. In the case of technical and vocational education the following programme strategies have been outlined:

- Develop programmes that will cater for those who discontinue education at various levels.
- Upgrade and improve the existing technical schools and open new ones.
- Open more basic level skill development centres in different vocational programmes.
- Develop teacher-training schemes through different means.

4.3 Motivation for training in the fisheries sector

Due to the war, many skilled traditional fishermen fled the country. Social practices and the culture of traditional fishing knowledge faded and traditional fishing boats and fishing equipment were severely damaged (Soekotjo, 1994: 1). Moreover, the decades of penalizing the traditional fishermen through deprivation of nourishment and a shadowy future of insecure food sources as well as severe malnutrition was

widespread in coastal communities. According to Soekotjo (1994: 1) the Eritrean government identified fisheries as an important target sector for reconstruction. The newly established fishing training centre aimed to teach and transfer fishing technology to the coastal communities; improve technological skills of the workforce, develop collaborative initiatives; create jobs; offer training at all levels for all occupations; promote career opportunities in fishing for school leavers; offer opportunities and training in fishing for the disadvantaged and to improve the quality and capacity of training programmes (Chantal et al, 1997: 10). According to Chantal *et al* (1997) the training centre works under the supervision of the Ministry of Marine Resources, which is designed to build sufficient infrastructure and increase human resources and production capacity in fishing villages and fishing sectors (pp: 11).

4.4 The Hirgigo fisheries training centre

The Hirgigo Fishing Training Centre (HFTC) operates in the whole area of the coastline Zones. It has benefited considerably from the MMR and external assistance from the Non Governmental Organisations (NGO), Interkelinjke Stichting Ethiopie/Eritrea (ISEE). Both have been active in the construction of HFTC. One of the most visible contributions of ISEE and MMR is grassroots development through improving the quality life of the traditional fishermen of the Northern and Southern Red Sea zones coastal communities. In doing so, it has also highlighted gender issues since fishing is mostly a male activity, although in the rural coastal fishing groups, women are often engaged in subsistence fishing and related household activities (Chantal *et.al* 1997: 5-6). Women need to be involved in fishing activities to actively improve fishing techniques, fish production and marketing in the coastal and island zones (ibid, 997).

4.5 Setting up of the training curriculum and programmes

The Hirgigo Fishing Training Centre (HFTC) curriculum offers various training programmes to extension agents and officers as well as to new and traditional fishermen as short-term courses. Short-term programmes in theoretical and practical fishing training are given to the fishery extension agents and officers, while new and traditional fishermen are only exposed to the practically oriented aspects of the programmes.

Captain Leake (2003), coordinator and head of the HFTC[2], explained that for effective and efficient running of the training programmes, the following set-up was proposed, with four major departments. All departments run long and short course programmes, where the lengths of the courses depend upon their depth. Short-term programmes have a duration of one to three months while the long-term programmes will take a between six months and one year to complete. The four main departments are as follows:

a) Nautical science department
b) Fish technology department
c) Marine engineering department
d) Fisheries management department

4.6 Training participants

Since 1995 the training activities of the centre have grown rapidly. The Hirgigo Fishing Training Centre is focused on training new fishermen, traditional fishermen, extension agents and extension officers.

Training of extension workers: Trainees are selected from village fishing co-operatives or recruited by the Ministry to help members of their home village or fishing co-operative, as guide cadres or co-operative managers. The extension workers' training programme is divided into two categories, one for extension agents and another for extension officers:

- *Training of extension agents* from the fishing villages who will, after completing the training programme, be located in the fishing co-operatives or villages as immediate fisheries guide cadres and act as the direct bridge between the Ministry and fishing communities and co-operatives. Successful trainees are posted to their respective villages where they work hand in hand with fishermen. The duration of the training programme is three months and the entry qualification required is a minimum of grade eight.
- *Training of extension officers*: The training of extension officers is expected to produce officials with broad knowledge and skills. After the training programme is completed, trainees are to be positioned in major fisheries

[2] Interviewee, Director and coordinator of the HFTC

centres/zones. These officers will be administrators/managers in co-operatives and fishing villages and will implement and supervise the policies set by the Ministry as well as all fishing activities within their zones, plan fishing activities and schedules, and collect and store data. Extension officers act as representatives of the Ministry within the fishing communities. The duration of the programme is six months, with intensive theoretical aspects and practice. Candidates for the training must have a minimum of grade twelve or have three or more years work experience in extension service.

Training of new fishermen: The training centre is also absorbing the younger generation of fishermen who are taught modern fishing techniques and later involved in fishing activities. The graduates are sent back to their fishing communities to assist co-operatives within their communities or within nearby communities. New fishermen participants also include migrant returnees from abroad and demobilized soldiers who may be able to form small-scale fishermen societies. The training programme for new fishermen introduces new technologies and skills to change the prevailing fishing activities to scientific fishing methods. The course is both theoretical and practical, with duration of between three and six months, depending on the trainee's age, educational ability and previous experience. The candidates for this training course must have a minimum of grade eight as well as a good understanding of English.

Training of existing fishermen: The centre trains local existing fishermen who want to upgrade their skills and learn new modern fishing techniques. These participants are the main respondents in this research project. With regards to the traditional fishermen programme, the head of HRD (2003) explained that the role of the Ministry of Marine Resources has changed considerably since 1994. In addition to the key concerns such as sustainable development of marine and fisheries resources; generation of income and food security; upgrading of domestic fishing industries and traditional coastal and island villages; several new challenges have also emerged. These challenges include improving the management of fisheries' and the marine environment.

According to M/Ali (2003) the purpose of the training for traditional fishermen (that is, to upgrade their fishing skills) was based on a needs analysis of the work required in fishing and established in cooperation with co-operative societies. The traditional

fishermen's training programmes are periodically reviewed and kept up to date with technical developments and other changes affecting the fishing industry (ibid. 2003). The duration of this programme is about three months and the training is mostly practically oriented. The head and coordinator of HFTC (personal comm. 2003) explained that there is general agreement that while the course must cater for the development of traditional fishermen, there is also a need for the course to adapt to their fishing abilities - as well as changing circumstances.

The programmes of all short and long-term courses are almost universally well regarded by fishery departments, who continue to support a broad-based regional training programme for all fisheries including the traditional fisheries sector.

4.7 Short-term courses for traditional fishermen and the curricula of the courses

Captain Leake (2003) explained that two main departments; the Nautical Science Department (NSD) and the Fish Technology Department (FTD) together cover the curricula of the short-term courses. These courses are compulsory for all other trainees, such as new fishermen, extension agents and extension officer trainees. For these trainees the courses include both theoretical and practical components. These courses are also viewed as fundamental training for the traditional fishermen, to help them work with new fishing techniques – although only the practical components of these courses are offered to traditional fishermen trainees. The full contents of the two courses are discussed below:

4.7.1 Nautical science

This module is offered by the Nautical Science Department of the MMR, and runs for one and a half months. The module comprises the following courses: 1) Open motorboat, 2) First aid, and 3) Survival at sea. These courses can be taken individually.

Open motorboats: The practical component of this course runs for one week. It instructs the traditional fishermen in how to handle the boat and navigation, find fish, operate and maintain the engines, practical work at sea, manoeuvring, motoring and anchor practice.

First aid and fire fighting: The practical component of this course also runs for one week. The course instructs the traditional fishermen in how to treat themselves while on the boat and during fishing. The first aid component covers the following subjects: Principles of first aid; structure and function of the body; shock treatment; dressing and bandages; fractures; circulation of blood and respiratory system poisons; and routine examination of patient. Fire fighting is an important component for the fishermen as it includes boat and ship fire protection and fire regulations for ships. It covers the following subjects: Fire fighting equipment; ship fire protection; care of equipment; principles of search and rescue; and fire regulations for ships.

Survival at sea: Survival at sea gives the fishermen detailed knowledge about the safety of the crew fishermen and the handling of life on the boat. This practical course runs for two weeks. It covers the following subjects: Handling of the life boat; regulations on inflatable dinghies; use of distress signals; up keep and testing of life saving equipment on board; and rowing and survival at sea.

Deckhand: This is another very important course to teach the fishermen the signals and types of knots used during the landing and on the deck of the ship. The practical component of this course runs for two weeks and comprises the following subjects: Rope and wire works; types of knots practice; signals; and rope work and twines.

4.7.2 Fishing technology

Fishing technology is another module, which is compulsory for all trainees. This module is offered by the Fishing Technology Unit of MMR and runs for one and a half months. The practical components are provided for the traditional fishermen trainees. The module comprises the following training courses: 1) Fishing gear and methods 2) Quality control 3) Marketing and distribution 4) The role of the Market and its impact on the exploitation of fishing resources and 5) Nutrition.

Fishing gear and methods: The practical component of this course runs for three weeks. This course teaches traditional fishermen how to make and repair fishing nets, how and when to classify and use fishing net accessories during fishing, gear workshop practice, and fishing practices and techniques.

Quality control: The practical component of this course runs for two weeks. This course covers topics such as how to handle the fish, fishing nets, boat and fish supplies during the fishing, at the dock and at the market places.

Marketing and distribution and ***nutrition*** courses both run for one week each. They involve workshop practice and demonstrate how to handle, distribute and sell the fish in the market, as well as money saving practices and nutrition.

4.8. Conditions of the trainers at the HFTC

Trainers who are hired to train in HFTC also work for other departments of the MMR. Training of fishermen was reported to be done with the minimum of resources and was reported to not be properly organised. Because there is no coordination of training within the Ministry's sectors, the whole concept of training is very ineffective. This gap definitely hinders the training and development of the traditional and other fishery sectors. For this reason HFTC plans to link to Asmara University to help coordinate the training activities and develop a new fishing research and training institute.

Mengteab and Leake (2003) explained that the MMR has offered training opportunities abroad and in local programmes, with the intention of some of its personnel becoming experts for the Ministry, including the HFTC. However, these trainers are not working as permanent trainers in the HFTC, but are more concentrated on technical work within departments of the Ministry. Although most of the HFTC trainers come from these departments and have a responsibility to provide training in the HFTC, they are required to train the new, traditional, extension agents and officers and even individuals in industrial fishery sectors - in addition to their work in their 'home' departments. Table 2 shows existing technical trainers available in HFTC and the Ministry of Marine Resources.

Section	Professional	Semi skilled
Extension agents	2	19
Credit & Co-operative	3	17
Boat operators	-	3
Boat builders	3	22
Fish handling	3	-
Nutrition	2	-
Inland fisheries	3	-
Fish inspectors	-	14
Coastal navigation	6 (semi professional)	16
Engineering	2	7
Refrigeration	-	7
Gear technology	-	3

Table 2. Existing technical trainers manpower available in HFTC and Ministry of Marine Resources[3]

The researcher observed four people who were the permanent, professional and key staff workers in HFTC in Hirgigo and in the main head office of the fishing training centres in Massawa. One person was a coordinator, a director, as well as a teacher; the second person was the head of the engineering workshop and a teacher. The third person was an engineer's assistant and trainer while the fourth person was hired as a permanent trainer in the fish processing and handling programme as well as being the secretary of the HFTC.

The fact that no permanent trainers were allocated to the centre, suggests that the development of the centre may be retarded due to lack of available training time and, as a result, possibly a lack of commitment to the work programmes amongst the trainers. Nevertheless, officials reported that existing expatriates within the Ministry could be used to assist the local trainers (ibid. 2003). Officials reported that workers of the Ministry departments act simultaneously as trainers in the fishing training centre. They reported that these workers are well trained in their work and training performance, learn to work differently through improved performance, and use their new learning on the job, becoming more self-confident (ibid. 2003).

[3] Professional & semi-skilled trainers of the Ministry of Marine Resources, (Source: Ministry of Fishing. Human resources need assessment report (2003)

4.9 Training and its effectiveness

According to the MMR Annual Report (2003), the quality of the training programme is greatly influenced by senior management, who set the policies designed to support the training efforts. Management is committed to providing an organisational climate that is conducive to continued learning and growth. The training staff should posses certain qualities in order to inspire trainees and should be technically competent with appropriate education and experience to teach the trainees. At present the training staff are hired or assigned on a temporary basis, for the reason that it is costly to employ permanent staff. But the information presented in the MMR Annual Report suggests that the Ministry has many well-educated staff that could be utilised, if the allocation of manpower was improved (MMR, 2003; see also Table 2).

CHAPTER FIVE

EVALUATION OF THE TRAINING PROGRAMME

5.1 Introduction

This section of the study evaluates the potential of the HFTC programmes to contribute to desirable change within the rural fishing communities. The evaluation process has taken place from the perspective of the key training participants, since they are often the best means of evaluating the training programme. Also important has been promoting the reflection and critical analysis by training participants of their own experience – that is to say the efficiency and impact of the fishing training programme. Subsequently, the study shall also analyse how the training and development programme could face the challenges of penetrating the social and cultural context, traditional knowledge, technology and customs of the traditional fishing communities.

5.2 Theoretical concepts for the evaluation of the training programme

To carry out a systematic approach to the evaluation of the training programme, the researcher needs to begin from the objective of the training programme and the development goals which need to be achieved. At the same time, the social and cultural features of the coastal and island traditional fishing communities must be included, in that they are the primary beneficiaries of the fishing training programme. As a result, it essential to explore how the concepts of the training will address concrete issues such as the relevance of the curricula, the administrators, coordinators and trainers, as well as the support provided during and after the training. These all are necessary to evaluate the training programme. Mawer (1999:27) argues that the standard of such type of ingredients, as well as updating the actual training to include emerging new skills and required qualifications, are important for ensuring the success of the programme.

5.3 The objectives of the training programme

Development depends on mobilising people, and therefore participation is an essential element for developing an improved standard of living and quality of life. Training is

one crucial means of mobilising people towards development goals and social developments. In the case of this study, the challenge presented to the Eritrean government to best transfer modern scientific knowledge (regarding fishing practices) to rural coastal communities. Hirgigo Fishing Training Centre (HFTC) was developed as a formal and institutional training centre involving various training peers, administrators, trainers and trainees. Its curricula are designed to be directly related to learner's interests and so encourage an environment of partnership. Therefore, this researcher considers participants who are involved in the said training programmes to be indispensable partners in its evaluation.

The study found that there has been progress over time in meeting the objectives of the training programme, and that the objectives of the fishing training programmes have been proclaimed by the MMR as final and definite techniques of development within rural fishing villages. The focal point of the training project is on communicating new fishing skills, gaining new information and knowledge, and movement towards improved fishing skills and techniques amongst the traditional fishing communities.

According to Mawer (1999) the way to deal which changes and adoption is by enhancing people's capacity to develop new skills and apply these new skills quickly and effectively (pp: 28). With the growth of the training centre, the fishing training programme activities have also increased. The study found that the training centre rapidly increased the number of training participants between 1995 and 2003; including new fishermen, traditional fishermen, extension agents and extension officers. The objectives of the training programme are also to maximize the quality and utility of the training provided, the skill levels, the knowledge and attitudes of the trainers and improve the management of the training and development. The objectives further include improving the collective and individual traditional fishermen's skills and performance, and changing the attitudes, emotional reactions and behaviour of the coastal inhabitants.

5.4 Curricula of the training programme

The curricula of the fishing training programme, designed for the traditional fishermen, views preliminary fishing training techniques as essential for success. The curricula are thus designed to provide practical skills and support. Traditional fishing trainees receive training through lecture methods and practically oriented training aboard a variety of fishing boats, as well as in workshops and in fieldwork. The curricula prepared for the trainees is focussed on modern fishing techniques, so that they use modern fishing equipment such as motorised boats, navigation devices, and modern fishing gear.

According to the training participants, the curricula were appropriately tailored to their fishing abilities. The study found that the curricula are well organised into modules such as nautical science and fish technology, and are of benefit to the trainees. The courses are designed to run for three months, or less, with a distinct practical focus. This was useful because firstly, the traditional fishermen are already familiar with fishing skills, and secondly because most of the people in coastal communities are functionally illiterate. As such, the curricula seemed appropriate and sufficiently uncomplicated for those persons engaged in traditional rural fishing activities.

From the coordinator's (Ato Leake, 2003: personal comm.) viewpoint the curricula of HFTC are almost universally recognised by fishery departments, who continue to support a broad-based regional training programme for all fishery sectors. He also explained that while the curricula provided for traditional fishermen, there was also a requirement that the courses adapt and change to their target audiences' changing circumstances and fishing abilities.

5.5 Lecture style delivery and the in-service training

The training programme is participatory with the minimum of oral lecture style delivery. This training approach is based on adult education theory which shows that adults learn most by doing and by reference to their own experience, and learn least by listening (Bembridge, 1992: 38). This principle is embodied in each of the components of the training programme to create, as far as possible, a variety of

learning opportunities for the participating fishermen. The training programme of the HFTC is thus given in the style of 'in-service' training.

The periods of training are short, so that the training is given in oral lecture or class discussion for 2 hours, and then followed by in-service training through practical work such as demonstrations and fieldwork. Both oral and practical in-service training are more or less similar to the way that traditional fishermen operate in daily fishing activities. At the end of the in-service training, group discussions are held. This is very important in order to strengthen and review the material learned by the group of traditional fishing trainees. There is also an entertainment and break time during class lectures and fieldwork.

The study found that the teaching aids in the HFTC are in the form of manual training handbooks for traditional fishermen; there are also public address systems, demonstration maps and equipment in each classroom, and workshop centre. These training aids make the instructions and training more understandable for the traditional fishermen. The training style seems to support the transfer of new fishing techniques and skills, which are beneficial for shaping future fishing activity.

5.6 Programme follow-up phase

In order to assist trainees in completing the training courses successfully, the oral and practical courses are re-evaluated at the end of each course delivery. This approach may eventually serve as a primary component of the fishing training centre's teaching system. At the end of the training modules, a practical examination is held, and successful trained fishermen are given a certificate. Among the trainees who pass, grades are used to identify achievers for special prizes consisting of fishing boats, money or fishing equipment.

The study found that the relationship with the programme does not end with course completion. After this, the post-programme phase of support and encouragement continues actively through the Ministry of Marine Resource (HFTC), together with the Credit and Co-operative Unit (CCU). After trainees return to their villages, HFTC and CCU encourage funding, lend fishing boats and fishing equipment, and continue to motivate trainees to reintegrate with the co-operatives in their villages.

The study showed that the HFTC training project encourages not only youth and adult fishermen, but also non-fishermen who want to become involved in fishing activities in the coastal and inland zones of Eritrea. Training attempts to relate to the fishermens' own experience and problem-solving skills, so supporting the interdisciplinary adult learning approach. The annual report of MMR (2003) stated that the follow up programme has been periodically reviewed and kept up to date with technical developments to continue to encourage traditional fishing communities. Moreover, the training and funding programmes are viewed as motivational for the fishermen and non-fishermen in their fishing activities, and as useful for strengthening the fishing co-operatives.

5.7 **Participants**

The primary aim of this study is to determine the training participants' perception of the effectiveness of the training programme. The success of the training programme is evaluated from the benefits perceived by the traditional fishermen trainees. Therefore, traditional trained fishermen are considered key informants in the evaluation of the training. The total number of the traditional fishermen in the region is 1700. Out of these, 200 traditional fishermen have been selected, from between the beginning of the training programme up to the end 2002, to train in the HFTC. These fishermen are selected from all coastal communities through the co-operatives in their villages. Out of the total 200 trained fishermen, 30 of them were selected for the study sample. Out of the 30 trained fishermen, 9 have attained the level of 5^{th} grade in their previous education, and can read and write properly. Most of them the 9 are from the cities of Massawa and Assab. Eleven of the trained fishermen have attained the level of 4^{th} grade or less in their previous education although they can read and write. These eleven are from fishing cities, towns and villages. Ten of the total 30 trained fishermen in the sample are not educated and cannot read and write. All ten of these fishermen come from fishing villages.

The researcher decided to measure the importance of the training modules from the trained group of respondents' prioritisation of the training courses. It seems that the most important courses identified by this group were those that were crucial for traditional fishing activities. Navigational practice was identified as the most

important course for fishing activities by 45 percent of the participants.[1] Navigational practice is one of the open motorboat courses in the nautical science module, and deals with how to face rough sea conditions during fishing, how to face the difficulties of the sea, how to read the compass and how to communicate through signals with other fishing boats during fishing. This was identified as the most important course because fishermen identified rough sea conditions as a frequent problem. Gear technology was identified as the most important course by 65 percent of the informant. This course includes subject such as net mending, fishing practices, fishing gear and the maintenance of the fishing gear. Respondents explained that these subjects are important as they teach fishermen how to run and maintain fishing machinery and introduce new fishing skill technologies.

5.8. Quality of communication

Leake, the head of the training centre (2003) explained that the quality of the communication techniques in the training is the most important means to achieve the development of marine resources in order to generate additional income and food security in the coastal communities. After testing the training curricula and training programme, the quality of the communication and its impact lingered as a key contribution of the training centre to facilitating the transfer of fishing techniques, knowledge and ability to the trainees.

As a result, the training centre is rapidly expanding and the quality of the management and trainers is improving. This is despite the difficulties regarding quality communication with rural fishermen, who come from different language and tribal backgrounds.

5.8.1 Instructors

Mengeasteab (2003) pointed out that the training centre programme is run through affiliation agreements between the training centre department and other departments within MMR. Some of the trainers of the HFTC are permanent workers in other

[1] Navigation is defined as the art of directing a ship from one place to another using nautical charts and other navigational instruments. The widespread use of position fixing systems such as "GPS" are among the most important factors in safe navigation today (Cpt Leake Zeru, Jan 2002: 3)

departments of the MMR. These trainers are visitors and part-time trainers in the training centre, in addition to their other work. Of the total number of 8 trainers across the four training programmes, 4 are visitors and part time instructors from other departments of the MMR.

All trainers of the traditional fishermen are instructors qualified to train in basic fishing skills. According to M/Ali (2003), the measurement of the trainers' qualification is firstly, the trainers' education and secondly the trainers' experience, as measured by the length of time that the trainer has been employed as a qualified trainer and how much experience the trainer has had in the fishing sector. The instructors are approved through their aptitude and education, and are then retrained by the HFTC and other external but related institutions. Almost all of the trainers and course instructors in the HFTC have at least a diploma and have graduated from universities and other related institutes.

The study found that the trainees' perceive the trainers to be friendly, willing to listen, answer questions and willing to learn more about the circumstances of the fishermen. They were also perceived to be fair and willing to make sure that the course content is useful to the fishermen. They were perceived to have a good knowledge of the subject, and to speak in the language that the trainees speak and understand. Training participants did however comment that at some times obstacles occurred during the training. These were described as being that, when training classes were short of time, the instructors did not repeat information or listen to questions from the trainees. One of the respondents reported difficulties since he is illiterate and could not understand what was written on the blackboard. All the trainee respondents commented that they had never seen the trainers after the training was completed.

5.8.2 Language

Vallely (1992) explained that the most widely used national and teaching languages in Eritrea are Tigrinya and Arabic. In the HFTC training courses both languages are used as teaching languages for local fishermen. Some of the long-term training courses included English as the teaching medium. The study found that the trainee fishermen

are from various coastal villages and have various mother tongue (first) languages. Forty percent of the population are first language Tigre speakers, 30% speak Afar as their first language, 20% speak Saho as their first language, and among the 10% from the highland region (the Halibai co-operative), 9% are first language Tigriya speakers, and 1% speak Blein as their first language.

The study found that, from the traditional trained fishermen sample of the study, 95% can manage to speak the first national language of Tigrinya, while less than 30% can manage to read and write with the writing script of Tigrinya. Five percent are reasonably able to understand Tigrinya, but find it difficult to speak. The second national language is Arabic. The study found that 95% of the training participants in the sample could speak and understand Arabic, but only 25% could read the language and only 5% could read and write it. The remaining five percent were reasonably able to understand Arabic, but found it difficult to speak.

The training courses offered to the traditional fishermen are taught in Tigrinya and Arabic, which nearly all of the respondents could speak and understand. Since these courses are applied and practical, the explanation of the training can be given in various other languages. While most of the coastal communities (and 98% of the sample) can manage to understand at least three different local languages, oral and written teaching in other languages would be difficult as skills in other languages differed.

Ninety-eight percent of the respondents speak Tigre, while 2% cannot speak or understand the language. Fifty-five 55% can speak Saho, 5% can understand the language while 40% cannot speak or understand Saho. Afar is also similar to the Saho language and 70% of the respondents could speak the language but had difficulty to understand it, while the remaining 30% could speak and understand Afar. The Tigre language can be written in Geez script (as is Tigrinya and Arabic) so that Tigre can be read and written by those who can read Tigrinya (in the Geez script) and Arabic. Saho and Afar are written in a Latin script and about 96% of the sample could not read it, while only 3% of the respondents could read and write the Latin script.

CHAPTER SIX

THE DEVELOPMENT CHALLENGES

6.1 Introduction

The analytical discussion of this study is focused on the training programmes' attempts to understand the social and cultural characteristics of the rural fishing communities, in order to facilitate and achieve development goals. A central issue of the study is the analysis of the training through the human knowledge framework. The main concern here is how scientific knowledge or modern fishing training goals could, and should be best integrated with traditional fishing knowledge. Human knowledge is crucial to improve fishing activities and the standard of living in rural coastal communities. Specifically, training is needed to develop the rural fishing villages.

Furthermore, there is much evidence that the traditional fishing sectors depend mostly on their own traditional knowledge, technology and customs; which play a significant role in sustaining the basic needs of coastal communities over time. To realise the goal of integration and to identify development challenges, it is essential that the social and cultural features of traditional fisheries, traditional fishing knowledge, religious and cultural backgrounds, and other livelihood activities related to the basic needs, are recognised as indispensable for grassroots development of the coastal and island communities. The combination of both scientific and traditional knowledge could contribute to improved understanding of social and cultural characteristics and so assist with the development of the coastal and island fishing villages.

6.2 Implications of the social and cultural characteristics of the traditional fisheries for the usefulness of the HFTC training programmes

The location of Eritrea exposes the country to the influences of a diversity of other cultures both from across the sea and from inland. The people of the narrow coastal zone of the Red Sea welcome new cultures, since in the past waves of migration across the Red Sea brought different peoples and cultures to settle in the rural coastlines and islands. According to Alamin (2003), other influences on social and cultural relations in this region were the growth and maintenance of kinship

obligations. Specifically the formation of clans and sub-clans which lead to the adoption of technologies, knowledge and the social division of labour over long periods. In Eritrean coastal societies, socio-cultural behaviours are handed down and added to over time, largely through learning-by-doing and oral tradition.

The social and cultural characteristics of every society are vast, closely related to the environmental context and evolve in the context of interaction with the social, technological and economic characteristics particular to the society. The variables of social organisation, technology and economy seem to undergo a great degree of change, as they are the products of 'human knowledge' (Ruhman, 2000). 'Human knowledge' is a crucial factor in understanding the social and cultural features of rural fishing communities. It is also crucial to consider the historical background and the interaction of various forms of 'knowledge' within the society. One of the problematic features of development programmes and training are the difficulties encountered in penetrating traditional knowledge. Without understanding the social and cultural features of traditional fishermen as well as their grassroots cultural heritage and knowledge, it is very difficult to achieve positive developmental goals.

Traditional fishing in Eritrea is increasingly coming under pressure from factions who are pursuing the modern scientific paradigm. Development programmes are thus needed to support local tradition – such as the relations between nature and fishing practices as a skilled art, involving rapid calculations of the nature of the sea and marine resources, the best kind of fishing harvest, the care and breeding of fish, the gender division of labour, and trading tactics. According to Williams (1987), the apprenticeship system, in which one became a skilled craftsman, reflects the importance of this traditional style of knowledge.

Training is one of the vital mechanisms of modern development. Training brings rapid change, and mostly directed at achieving technological growth through scientific knowledge. Its role in transferring technological advancements or new fishing knowledge is recognised as important in the context of this study. However, without understanding of the grassroots social features, cultural heritages and traditional fishermen's knowledge, it is difficult to achieve development goals using 'modern' or 'scientific' training alone.

According to Gadgil *et al.* (1993), social and cultural aspects of developing societies were frequently considered a 'drag' on their transformation into modern economies. For example, traditional fishing practices are perceived to be barriers to new technological changes and the expansion of fish markets. The failures of largely technological and economic oriented development policies, provides the basis for a new search of scientific knowledge; a search to give fresh meaning to neglected socio-cultural norms before they are transformed beyond recognition (Gadgil *et al.*, 1993).

M/Ali (2003), head of Human Resource Development in MMR, considers the training of traditional fishermen in basic fishing techniques to be an important activity, and of benefit to rural coastal fishing villages. The requirement of the subject matter is that it integrates scientific and traditional knowledge. M/Ali (2003) explained that, 'we need to live the real "new life" in a new country... we have to see the fruits of our efforts by using the resources we have'. In making this statement, the head of HRD in MMR suggests that the people of the coastal communities have not yet utilised the full potential of human and natural resources in their possession. He also pointed out that the people of Eritrea would face challenges not only in socio-cultural development, but also in every step of all other types of development.

One of the challenges to be overcome that he identified, was that the people are not aware of their own capabilities and strengths that they could use to improve their standard of living. When asked to comment on what he meant by 'the new life' and 'new country' he replied that Eritrean people who have suffered through the long time of war and lost their customs and traditions, now deserve to benefit from the prosperous resources that we possess in our own Sea. While this suggests that Eritrean independence may increase the perceived value of the national cultures and national resources control, the following section discusses some of the incompatibilities of the modern fishing training programme with traditional fishing practices and societies.

6.2.1 Traditional fishing is small-scale capture fishing

Most of the international development agencies classify fisheries in two primary categories: aqua-cultural and capture fishing '...thereby compounding the erroneous belief that the two types have a great deal in common... in fact, one of the few things

they have in common is the product fish' (Pollnac, 1989:261). Eritrean fishing is categorised as capture fishing, although it includes several distinct types. This categorisation is related to the socio-cultural characteristics of the traditional communities in which small or large-scale fishing is found. The term 'traditional fishing' is interchangeable with terms like 'artisanal fishing' and 'subsistence fishing' (Francis, 1986). Generally, traditional fishermen are located in rural and coastal areas. They harvest stocks with a small biomass, which contain a large variety of species suitable for domestic consumption; and they supply most of the cured fish and fish intended for direct human consumption (Sifery-yonnis, *et al.*, 1982: 27-28).

To train traditional fishermen in new fishing techniques can make them more effective, and more productive. This training seems to focus on what may be termed 'scale'. This implies converting small scale fishing to large scale fishing, or converting traditional fishing activities into industrial and technologically advanced fishing systems. As this study found, the current social organisation and ideology of coastal communities is not suited to industrialized fishing and the associated use of modern technology, which may not be practical for the social, economic and environmental context of traditional fishing in Eritrea. As marine economists researchers claim, industrial or large-scale fishing leads to over exploitation of marine resources, suggesting that attempting to increase the scale of fishing is *not* appropriate for improving the lives of rural fishing communities.

6.2.2 Resource variability in traditional fishing

One of the main characteristics of traditional fishing communities is usually the degree of variability in fish harvests (Pollnac, 1989: 262). Eritrean coastal communities are characterised by short-term unpredictable variability[1] in marine resources. The Eritrean coastal and island fishing communities are dependant on the weather and the availability of the fish. When the weather is good, fish are available, and vice versa. Thus, traditional fishing is not a routine daily activity and is totally different from the other, daily livelihood occupations such as animal husbandry. As bad weather makes traditional fishing dangerous or impossible, there is a great deal of

[1] As Pollnac (1998) categorised three types of resource variability, (1) long term, predictable (seasonal); (2) long-term usually not predictable (because of population changes associated with over fishing, climate, or other external factors) (3) short-term unpredictable (variation in the day-to-day catch). As a result, most fishing communities develop specific socio-cultural attributes.

day-to-day variation in catch and resulting income. Non-fishermen of the coastal communities have long-standing relationships with the fishermen and they are familiar with their problems. Because they understand these environmental constraints, they provide loans and permit a great deal of flexibility in the repayment of loans.

The study found that fishing trip characteristics depend upon the weather and the condition of the sea. The fishermen reported that the shortest fishing trips are between 5 days and 1 week, while the longest they spend on a fishing trip is two to three weeks. The increased difficulty of catching fish is sometimes attributed to climate change, as well as changing currents that may be strong enough to prevent the boats from landing. They may be kept ashore for long periods.

Training cannot change the variability of resources facing traditional fishermen. The survival of traditional fishermen and their families depends heavily upon weather and sea conditions but, complemented by the compassion of non-fishermen, they have adapted to the variability of fish harvests (Pollnac, 1989: 265).

The study found that, from the perspective of traditional fishermen, fishing activities depend upon the type of fishing technique, the type and availability of fish species to be harvested, and the weather and condition of the sea. The training programme is not able or intended to change the variability characteristics of fishing, to which both fishing and non-fishing people have adapted.

6.2.3 Traditional knowledge and multiple livelihoods

Fishing coastal and island villages are not entirely reliant upon fishing, and are continuously engaged in non-fishing activities. The traditional techniques and livelihood activities adopted by coastal communities vary from other, non-fishing inland areas. The nature of fishing in these areas encourages creative engagement in various activities, enabling communities to exploit both marine and land resources.

Traditional fishermen are involved in crop cultivation[2] and animal husbandry[3], in addition to fishing activities. They also sometimes use traditional sailing boats for transportation and trading activities. Therefore, traditional fishing communities have a greater diversity of livelihood activities than do other non-fishing communities.

Rural fishing communities in Eritrea have their own store of traditional knowledge related to their local practices and daily activities. However, fishing activity is a selective occupation in fishing villages, with its own difficulties. Sometimes, for example, the nets and traps are crude and let many fish escape. Equally, other livelihood activities also have their own difficulties. Above all, the study found that the main problems generated in fishing villages are a result of the multiple activities that necessarily overlap with each other and with fishing (Alamin, 2003).

In these cases, direct controls and improvements on specific resource use are less useful because of technological limitations. Most of the measures for use and management are developed through traditionally based experiences and knowledge that enables the survival of the communities. In the study, 50% of the trained fishermen in the sample felt that they had observed changes in fishing activities that were a direct result of the training. They felt that one benefit of the HFTC fishing training was that the techniques offered helped them to realise the importance of fishing as a lucrative activity. Yet the training programme did not result in the trained fishermen fishing full-time or earning money from fishing alone. They also spent time on non-fishing activities, such as crop cultivation and animal husbandry, which are considered traditional, and which they did not wish to neglect.

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[2] Eritrean coastal inhabitants are mainly engaged in activities such as farming i.e. growing of crops (Alamin, 2003). In almost all coastal communities, each member of the household is involved in agriculture and it was found that this is the main source of food and income for the majority of people. 'Thus, the communities grow, as the most important food, different types of crops such as sorghum; maize, okra, watermelon, tomatoes, millet, wheat, barley, and other crops, which depend on rainy seasons' (NRSAO, 2003 & Haile *et.al*, 1998: 15).

[3] In Eritrean coastal communities, livestock have been kept as a traditional norm for centuries, and are still an important sector among inshore agro-pasturalist coastal communities (Haile, 1998: 116). Haile *et.al* (1989) identified the most common as goats, camels, donkeys and small numbers of sheep and cows, which are mainly used as a source of food for the communities' consumption (pp: 117).

6.2.4 Traditional knowledge and fishing activities

Fishing operations are a result of the simultaneous integration of large numbers of discrete thought processes, including both past experiences and immediate observation (Kurien *et. al.*, 1987). According to Kurien *et. al.*, (1987) these include the feel of the sea-bottom, the smell of the sea, the sight of birds, the colour of the sea and the ripples on it, as well as the sound of swell movement. Jensen (1997) points out that traditional fishermen know the behaviour, migrations and reproductive cycles of many species of fish, and use this knowledge both to make catching fish easier and to protect species when they are particularly vulnerable.

Traditional fishing faces many difficulties, such as the weather and condition of the sea, night darkness, and the isolation from social kinship and religious obligations. The trained fishermen in the study felt that the training was not difficult for them because most of the new fishing techniques are similar to their previous fishing knowledge. Three of the 30 (total) trained fishermen informants indicated that they didn't have any problems related to fishing activities but that they did need help from the government to access fishing equipment that could enable them to harvest as much as they need.

The study found that the fishermen differentiated between traditional fishing knowledge and new fishing techniques. Training helped the fishermen in the sample to recognise new fishing techniques in addition to their traditional knowledge and fishing methods. The new training was not seen as a replacement of their traditional fishing heritage.

6.2.5 Kinship and religious obligations

'In most parts of Arabia, as on the western bank of the Red Sea, fishing is a despised occupation, and has been so from remote times' (Serjeant, 1995: 486). Among Eritrea coastline inhabitants, fishing has been viewed as a disgusting and horrible occupation. Such sentiments still exist in parts of some fishing communities. From the perception of the trained fishermen in the sample, fishing as a livelihood activity has been

perceived as an abhorrence primarily because it prevents fishermen from socialising, participating in community and kinship duties, or participating in ceremonies such as marriage, burial and child naming. Furthermore, fishermen are considered to not care for their families, because of the isolation and extended time periods associated with being at sea. They are also considered as criminals because they work by night. Respondents in the study felt that as a result of the training, this perception of fishing among traditional fishing societies is not as prevalent as it was in the past.

Kinship obligations in rural fishing villages reinforce strong tribal ties and maintain a strong cultural identity. Kinship obligations affect fishing activities and vice versa. One of the challenges of the training has been to affect kinship obligations, a task that has met with limited results. One of the trained fishermen in the sample reported that 'fish is our life ... we cannot survive without the marine prosperity... At the same time we have to obey societal obligations'. The training programme is seen to be a positive contribution as it encourages fishermen to work in a united way in co-operatives and has been seen to slightly improve previously negative views of fishermen. As the study found, there are many changes in the lives of inhabitants of fishing villages, but it is difficult to predict if, and how, the coastal and island communities will change their family and kinship structures.

The study found that in most of the rural coastal communities there are different perceptions of their multicultural diversity: tribe from tribe, kin from kin, family from family, among fishermen and non fishermen, and even sometimes among fishermen themselves. The trained traditional fishermen did not change their attitude towards kinship obligations and reported that they would never try to omit their cultural heritage. The participation of young men and husbands in fishing requires them to also satisfy their relatives and kin obligations. This is because men and husbands have high status in coastal cultures and they have to respect and uphold the obligations and rules of their culture.

The study found that the times of any activities among the coastal and island communities must allow for prayer times, since Muslims must perform prayer five times per day, at the home and at the work place. This is particularly important on Fridays when they must carry out group prayer at mosque, and during the month of Ramadan, the holy month of fasting, which fishermen want to spend with their

families. Religion is the most important aspect of life in the rural fishing communities; each and every individual in the community has to fulfil religious obligations, as do all Muslims.

The study found that the training programme has shown the traditional fishermen when and how to capture fish, but the trained fishermen will still ensure that departure for fishing is secondary to kinship and religious obligations. Not one of the fishermen in the sample felt the need to change his beliefs and his activities after the training. Inland coastal and island activities are encircled by kinship and religious obligations and it is very challenging to attempt to change or penetrate these characteristics.

6.3 Co-operatives and fishery development

This section considers the social and cultural aspects of fishing communities reported by respondents towards the end of the training programme. The training programme has been designed to work hand in hand with the Credit and Co-operative unit (CCU) to facilitate the implementation and development of traditional fisheries. Institutional change is perhaps the most difficult to achieve, with one relevant example being the fishermen's co-operative[4]. The purpose of this section is neither to advocate nor condemn fishermen's co-operative organisations in Eritrea. But it is necessary to consider them, as they are part of the post training support projects. The co-operatives are used as development interventions to make the traditional fishermen work in a united way. But here too, the social and cultural context of fishing communities has its own traditional means to encourage fishermen to work in a united way. From this point of view, Pollnac (1989) explained that worldwide experience has shown that while no predetermined co-operative model can ensure success in different fishing societies, a sociologically sensitive approach can be used to adjust the co-operative framework to meet the specific needs of fishing communities.

In addition to the training programme, the Ministry of Marine Resources (MMR) has a co-operative and credit programme, run through before and after the training under the Co-operative and Credit Unit (CCU). Its aim is to rehabilitate the traditional fishermen at the end of the training, through co-operative projects used to organise rural fishing communities. The fishing co-operatives encourage members to

[4]For the fishing co-operative model, see appendix D.

participate, to work in unity, and to acquire modern basic fishing knowledge made available by the MMR, through the extension and training programme. The extension programme works with each co-operative in the fishing villages. The training programme, which runs in HFTC, is targeted to give basic modern fishing knowledge related to sea activities as discussed in the chapter 4. At the end of the training the credit and cooperative unit facilitate the return of the trained fishermen to their affiliated village co-operative and offer credit for fishing necessities such as fishing boats, fishing equipment and other services. Another activity, which is run by the cooperative and credit units, is constructing inshore infrastructure, such as fishing docks and harbours. According to the traditional fishermens' perceptions the co-operative and credit unit programme is helpful for organising the fishing villages through remote and town links. Also that the methods for selecting fishermen for both the initial training and the subsequent credit provision, are considered fair.

CHAPTER SEVEN

CONCLUSIONS AND RECOMMENDATIONS

7.1 Introduction

Training is an important intervention to improve fishing activities and the lives of rural fishing communities. The objective of training in the Eritrean fishing sector is to expand and achieve excellence in base fishing skills and to increase the availability of trained fishermen in rural coastal and island communities. Training can also encompass measures to achieve training structures to support career progression in fishing sectors in general. The behaviour, skills, abilities, attitudes, customs and knowledge of local people characterise the main features of traditional fishing. These features, accumulated in traditional cultures, allow people to live co-operatively and to utilise marine and land resources. These traditional features are useful for exploring the ability of traditional fishing societies to survive over time.

From this study's standpoint, the interdependent processes of formal training and traditional fishing abilities (reflected in and reproduced through socio-cultural characteristics) are the primary methods for achieving improvements in fishing villages. The 'human knowledge' framework is useful for highlighting the socio-cultural characteristics as grassroots features that can embrace improvements made within rural coastal and island fishing communities. This means that integrating the role of modern developments with the characteristics and context of traditional fishermen is necessary to increase fishing harvests as needed.

There are possibilities for development interventions to successfully upgrade traditional fishing sectors, but the most fundamental requirement of development programmes is that traditional fishermen participate in training programmes (and their design) so that they can build on their existing knowledge – to get full benefit from their subsequent fishing activities. The Participatory Rural Appraisal approach argues that the only truly successful development approach, is one that reflects the needs and goals of the people themselves and that draws on their own traditional knowledge to involve them in the training programme.

For these reasons the nature of the training should be participatory, and the training programme and curricula must be appropriately designed for traditional fishermen - if it is to positively change their behaviour.

Thus 'human knowledge' can be transmitted across all societies through scientific and traditional knowledge. Formal training is important to achieve modern economic goals. For example, the Hirgigo Fishing Training Centre (HFTC) training programme and fishing co-operative development programme have achieved some success in the economic changes in the rural coastal and island communities by demonstrating the potential economic benefit of modern fishing methods. However, they cannot be completely effective or participatory, without understanding the grassroots social and cultural features of traditional rural fishing communities.

What this study proposes is that the process of development or training should be undertaken according to various independent factors such as the context of fishing communities' behaviour, their knowledge, values, environments and experiences. These are important criteria for evaluating the impact of a development or training programme. But they are not the only criteria: the impact of the development programme on society and quality of life are other important criteria to consider in further evaluations of the Hirgigo Fishing Training Centre (HFTC) training programme. To identify the social and cultural characteristics of traditional fishing as the main criteria for evaluating development programs, could leave the impact of the development programme on society and quality of life as a subject for further argument.

7.2 Recommendations

This study suggests that the training programme is valuable, but cannot be seen as the only strategy to support the coastal and island fishing communities. The study highlights the importance of understanding and including the social and cultural characteristics of the people living from marine resources as important ways to improve fishing skills and the living standard of coastal and island fishing communities. The social and cultural aspects of the fishing communities, which emerge from the historical interaction between nature and human society, take effect

within a work routine of fishing and other livelihood activities, and provide the specificity of any society. These characteristics accumulate over time and emerge largely through learning-by-doing and oral traditions of knowledge, experiences, stories and sayings.

7.2.1 Improving quality of life

The MMR has undertaken the rural fishing development programme to assist the traditional fishermen through improving fishing activity and developing not only capturing systems but also other mariculture[1] ventures. This has also involved providing fishing tools, credit, storage facilities, marketing and encouraging the diversification of catch to include more than one species. In the past, when there was no help from MMR development programmes, every fishing village had local experts, often old men or women who knew every fish on the reef and so similarly knew when and where to harvest them. They provided oral informal oral informal training related to traditional fishing processes such as dry fishing, smoking, salting and so on – depending upon available tools and facilities. Sometimes such a person was the master of the land, or the master fisherman. Often every family had their own special knowledge, handed down from generation to generation. In traditional cultures in Eritrea, this knowledge of the environment was closely related to religion and custom.

Development strategies to assist traditional fishermen should be concerned not only with transferring new fishing knowledge, but also with realising what the fishermen want or need, identifying and developing fishing community leaders, providing necessary technical assistance, and identifying institutions and non-profit organisations that can assist with partnerships and collaboration. For example, fishing community leaders or other potential leadership groups could pass on fishermens' issues, concerns and pleas to the MMR or other concerned bodies. Further development strategies could be embarked upon through continual "listening tour" programmes along the coastal and island villages in order to identify goals and develop strategies to achieve the development visions.

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[1] Mariculture is a term, mostly used in marine studies, which refers to the relation of the overall marine activities. The term is used by marine biologists, marine economists, anthropologists and marine development scientists.

In many cases, the failure of fishery development projects can be traced to a lack of understanding and respect for the social and cultural characteristics of coastal populations. Those responsible for rural coastal development projects often place so much emphasis on new technology as the key to development, that they overlook the specific nature of the communities in which they are working (Bailey *et al*, 1986). This results in traditional fishermen losing confidence in their own abilities and a loss of self-reliance in the rural coastal communities. For many groups of traditional fishermen this may lead to the failure of their livelihoods and self-esteem. This is why this study locates scientific and traditional knowledge together, as understanding the social and cultural characteristics of rural fishing communities are fundamental aspects in the development of these societies. In this way, scientific and traditional knowledge can lead to sustainable improvements in the living standards of rural coastal communities, enabling them to maximise returns and minimise the risks involved in coastal fishing.

7.2.2 Addressing coastal fishing constraints

Fishing is a potentially vital livelihood activity in comparison with the generally low nutrition + low income value of farming and other livelihood activities practiced in rural Eritrean coastal communities. However, the labour time required by fishing, and the way that fishing overlaps with other livelihood activities makes fishing more personally costly than other activities. The most important thing for rural fishing development or training programmes is to address time, labour and economic constraints so that it can become a more viable component of the overall livelihood activities.

In terms of the curricula and teaching methods, the HFTC fishing training is appropriate for improving the skills of traditional fishermen. The usefulness of co-ordinating the training with other sectors in the Ministry is difficult to predict since it is a recent venture. At the moment this co-ordination gap definitely hinders the process of training and development regarding the traditional fishing sector. Improved co-ordination between the training activities is necessary to address this issue. The development programme also has to focus on the importance of the subsistence and/or

employment of a large segment of the fishing population - in order to achieve sustainable grassroots development.

Traditional fishing in Eritrea faces its own unique difficulties. The knowledge of the coastal and island communities, as accumulated within their traditional cultures, has allowed the local people to face both marine and inland hardships, while living in relative harmony within these environments. It is useful to remember that traditional coastal and island societies have, by example, demonstrated their survivability. It is obvious that the resources are limited, but they have in the past learnt how to control their resource use or how to manage without the resources. If they did neither successfully they would have been forced to change their seasonal occupations or perish. Nevertheless, it is also useful to remember that there is considerable evidence that modern training and development programmes can improve life for traditional fishing communities in the long term. The value of development programmes would increase if their outlook placed greater value on traditional knowledge and the fishing management practices used by traditional experts.

7.2.3 Drawing on existing local institutions and social systems

In order to ensure the continual productivity and development of the marine resources and fishing villages, development programmes have to combine traditional characteristics and knowledge with scientific knowledge and techniques. Local fishing co-operatives in the coastal communities of Eritrea have proved very useful in uniting and organising traditional fishermen because these institutions have integrated the fishing work with the kinship and family affiliation system. Traditional fishing practices are based upon unwritten regulations and customary laws that protect individuals' needs and community interests. As a result fishery management; information gathering; analysis; planning and decision making; collection of resources as well as the formulation and enforcement of resource management regulations have to dovetail with the background of the traditional fishermen. Said management must further be simple and clear enough for local co-operatives to implement.

Ultimately, if someone devotes their life to improving their fishing skills, they too might become a local expert in their fishing village. This is why it is important that

the whole community understands what someone is learning, and works together to improve community life. This motivation is an essential requirement for success in the management of coastal and island resources. This will require patience, many hours of hard work and careful observation by both trainers and trainees. It means never being satisfied with what you already know and always being ready to admit that you are wrong, or that you do not know enough.

Appendix A

Covering letter for the data collection

University of KwaZulu-Natal Pietermaritzburg
Sociology Department
July 2003

Dear trained fishermen

Re: Evaluating HFTC to improve the socio-cultural context of the rural coastal communities: questionnaire and interview

I'm a master's student in sociology at the UKZN, PMB. I'm carrying out a survey of traditional fishery for my thesis

The study is aimed at evaluating the training centre and its programmes offered in HFTC in order to improve the fishing livelihood of the coastal communities.

Could you be so kind to assist me by answering the questions of the questionnaire and interview as frankly as you can? I fully guarantee that the information collected will be treated with confidentiality and anonymity.

I will not write or mention your name on the study

Your cooperation in this matter will be highly appreciated

Yours faithful

Hassan H. Alamin

Appendix B

Questionnaire (with variations for untrained individual fishermen and administrators and trainers)

1. How good are your skills in the following languages?	**Speak**			**Understand spoken language**			**Read**			**Write**		
	Good	Fair	Bad	Good	Fair	Bad	Good	Fair	Bad	Good	Fair	Bad
Tigrigna												
Tigre												
Arabic												
Afar												
Saho												
Others:												

2. Do you think that you need training in the following skills?	**Yes**	**No**
To improve your skill in catching fish?		
Please explain your response to the above question		
To improve your skill in maintaining boats and fishing equipments?		
Please explain your response to the above question		
To improve your skill in preserving fish?		
Please explain your response to the above question		
To improve your skill in selling fish?		
Please explain your response to the above question		

2. Continued ….Do you think that you need training in the following skills?	**Yes**	**No**
To improve your skill in working in and managing a fishing cooperation?		
Please explain your response to the above question		
To improve the living conditions of the people in your area?		
Please explain your response to the above question		
To impart knowledge and skills to allow you to work without help from other outside people?		
Please explain your response to the above question		
To advance you to achieve the best that you can?		
Please explain your response to the above question		

3. Have you taken any training in fishing skills in the HFTC? Yes/ No

4. Can you tell me what of courses you have done, when they were done and where they were done? Can you rate the value of the courses for you? 1=most useful; 5=least useful			
Type of the course	**When?**	**Where?**	**Value?**
Never taken a training course of any type			

5. Would you say that over the past few years	**Yes**	**No**	**Do not know**
The number of trainees have increased?			
Why do you think this is so?			
The number of trainees have decreased?			
Why do you think this is so?			

5.1 How important do you think the following reasons may be for increasing the number of trainees?					
	Very important	**Important**	**Not very important**	**Not at all important**	**Don't know**
The training is appropriate for the social lives of subsistence fishermen?					
The training is appropriate for the resources available to subsistence fishermen?					
The good attitudes of the trainers					

5.2 How important do you think the following reasons may be for reducing the number of trainees?					
	Very important	**Important**	**Not very important**	**Not at all important**	**Don't know**
The training is not appropriate for the social lives of subsistence fishermen?					
The training is not appropriate for the resources available to subsistence fishermen?					
The bad attitudes of the trainers					

6. What do you think is important for fishing in your area?

7. What training do you think is important in your area?

8. What do think about the trainers at Hirgigo fishing training centre themselves?	**Very good**	**Good**	**Not very good**	**Bad**	**Very bad**
Friendliness					
Willing to listen to you					
Willing to learn about your circumstances					
Willing to make sure that the course contents is useful to you					
Knowledge of the subject					
Willing to answer questions					
Ability to use language that you understand					
Their willingness to help you after the course has ended					
Other?					

9. Have you been changed after training? (Trained fishermen)

9.1. Have you seen any changes in progress after your colleagues were trained? (Untrained fishermen)
(If so then;) what type of development?

10. Who has implemented these progresses? Government, Agencies etc

11. How do you use marine resources in your daily lives?

12. Do you think crop growing is good in addition to fishing? Why?

13. Do you have animals? Is there enough food for your Cattle, donkeys goats etc.?

14. Do you like to be a trained fisherman?

15. Do you think there are enough fish in your sea?

16. Do you think fishing training is making it easier to get fish?

17. How much do you like to harvest fish? Why?

18. Is there any problem to fish in your offshore area? Why?

19. What livelihoods are you involved in? Can you tell me how much of your time is spent on these activities and how important (on scale of 1= most important) they are for your family's survival.						
Activity	**100% of time**	**75% of time**	**50% of time**	**25% of time**	**Less than 25% of time**	**Importance**
Fishing						
Farming						
Animal husbandry						
Other activities (Specify)						

20. Do you think our culture caters for sustainable use of natural resources? Why?

21. Do you like fishing training and does it help you in your work? Why?

22. What is your status in your village?

23. What do you think about attending marriage, renaming and funereal ceremonies during working days? Why?

24. Do like to work in Friday, during the month of Ramadan? Why?

25. Do you think everyone should plough or grow crops during rainy season? Why?

26. Are you becoming full of activity after training? Why?

Questions for administrators and trainers

27. What basic services do you have in the training centre?

28. Who provides you with these particular services? Government and agencies etc

29. Do you think your training centre has enough basic services to train traditional fishers?

Appendix C

Common fish species of the Eritrean coastal Red Sea waters

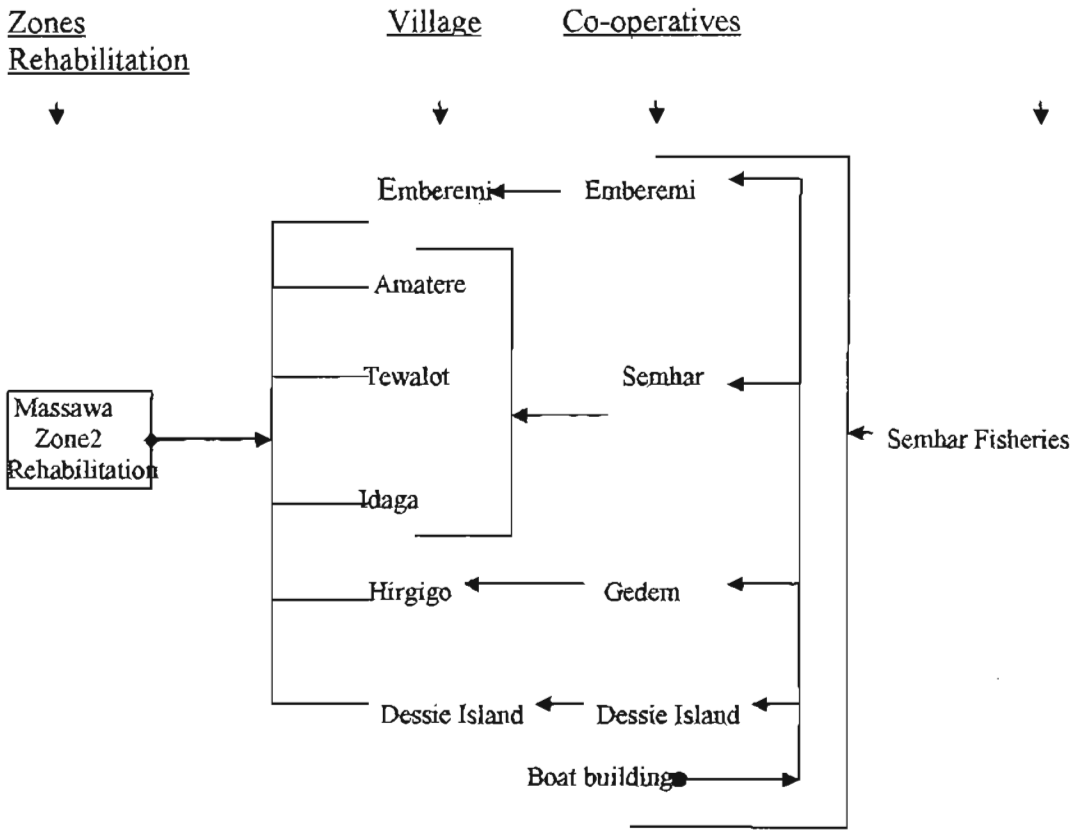
Coral Reef Fish	
Family	**Common name**
Seranidea	Grouper
Letherinidae	Emperor
Lutjanidea	Snapper
Scaridae	Parrot fish
Caraguidae	Jack fish
Demersal Reef Fish	
Carchahinidae	Sharks
Ariidae	Cat fish/Baracuda
Pelagic Reef Fish	
Harrengual/puncatata	Sardine
Herklotesichtys/puncatata	Spart
Thrissocles baelama	Anchovies
Medium-Large Pelagic reef fish	
Caranguidae	Jack or Trevally
Scomberromorus	Spanish Mackerel
Sphyraena spp.	Barracuda
Scombridae	Small Tuna/Tuna like fish

Common name	**Local name**
Sardine	Belem
Spart	Aburas
Anchovies	Wedif
	Aida
	Mekhelf

The highlighted families are local traditional names of species encountered in the artisanal fishery, whose common and scientific names are unknown by this researcher.

Appendix D

Fishing co-operatives under the Semhar Fishery Rehabilitation project



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