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**SOCIO-ECONOMIC SPECIAL STUDY**

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**ZAMBIA**

**Final Report**

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**Pollution control and other measures to protect biodiversity  
in Lake Tanganyika (RAF/92/G32)**

**Lutte contre la pollution et autres mesures visant à protéger  
la biodiversité du lac Tanganyika (RAF/92/G32)**

The Lake Tanganyika Biodiversity Project has been formulated to help the four riparian states (Burundi, Congo, Tanzania and Zambia) produce an effective and sustainable system for managing and conserving the biodiversity of Lake Tanganyika into the foreseeable future. It is funded by the Global Environmental Facility through the United Nations Development Programme.

Le Projet sur la Biodiversité du Lac Tanganyika a été formulé pour aider les quatre états riverains (Burundi, Congo, Tanzanie et Zambie) à élaborer un système efficace et durable pour gérer et conserver la diversité biologique du lac Tanganyika dans un avenir prévisible. Il est financé par le FEM (Fonds pour l'Environnement Mondial) par le biais du Programme des Nations Unies pour le Développement (PNUD)

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## EXECUTIVE SUMMARY

The Socio-economic Special Study identified four areas of focus: Fisheries livelihoods and practices; Agriculture; Natural resource use; and Population settlement and economic development.

The survey observed that fishing is no longer a seasonal occupation but takes place the whole year round. In the recent past fishermen have registered dwindling catches in spite of increased effort. The local communities put the responsibility on the many types and quantities of gear and increased number of fishermen as well as a proliferation of commercial fishing activities in the lake. One specific gear, beach seine net is blamed. Fishing is an activity for men mainly who may be owners of fishing gear, light boats/lamps or are employed as labourers. The fish caught is either sold fresh or dried. The preference is the selling of fish and is normally done in the village. Otherwise, some fishermen sell their fish to the commercial companies at Sumbu and Mpulungu. The companies have cold storage facilities and have the capacity to store large quantities. Occasionally, fishermen sell dry fish. Dry fish is normally sold out side the village at Mpulungu. Constraints that fishermen experience are:

- Unpredictable weather on the lake which makes the work risky due to strong winds;
- The borders of the Sumbu National Park are not well defined. A number of times fishermen are found encroaching in the protected area;
- Transportation of the produce to market centres is not so easy. The roads are bad while the lake sometimes becomes almost impossible to paddle through;
- Landing charges for fish at Mpulungu are too high.

An important finding is that even the lakeshore communities rely heavily on agriculture. A good proportion of lakeshore communities are in fact not fishermen but farmers. They grow crops for subsistence and income generation purposes. Major crops grown include cassava, bananas, sugarcanes, sweet potatoes, rice, beans, vegetables and millet. Livestock production is practised on a very small scale and is limited to goats, chickens and ducks. Farming is an activity that is practised by both men and women. However, there are specific gendered assignments - planting and weeding are women's tasks while land preparation is normally done by men. There are however times and circumstance when men and women share tasks. Constraints to farming in the lakeshore include:

- Lack of land;
- Crop destruction by wild animals;
- Lack of government programmes to support farming activities;
- Low prices for the product
- Lack of adequate support infrastructure such as roads, storage facilities, etc.
- Absence of marketing and processing infrastructure and therefore low producer prices.

Lack of agricultural land and absence of sound techniques of farming have negative effects on the conservation of biodiversity. They are responsible for making land prone to erosion and hence increase sedimentation of the lake. Woodland loss is also associated with demand for wood fuel for domestic use, fish smoking and brewing of traditional beer. Loss of tree cover contributes to erosion and amount and speed of runoff. These sometimes have detrimental effects such as flooding and sedimentation of stream banks and the lake<sup>1</sup>.

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<sup>1</sup> Floods in occurred in Kapoko village (1961/2, 1997/8) and in Kabyolwe in 1961/2, 1988/9)

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## LIST OF ABBREVIATIONS

ADMADE	Administrative Management Design
BioSS	Biodiversity Special Study
CIFA	Committee for Inland Fisheries Management in Africa
CSO	Central Statistical Office
DA	District Administrator
DRC	Democratic Republic of Congo
D-WaSHED	District Water, Sanitation, Health Education Project
FAO	The Food and Agricultural Organisation of the United Nations
FPSS	Fishing Practices Special Study
GMA	Game Management Area
LTBP	Lake Tanganyika Biodiversity Project
LTR	Lake Tanganyika Research
PolSS	Pollution Special Study
SAP	Strategic Action Programme for the Sustainable Management of Lake Tanganyika
SedSS	Sedimentation Special Study
SESS	Socio-Economic Special Study
SGS	SGS Zambia Limited
TDA	Transboundary Diagnostic Analysis
USAID	United States Agency for International Development
VCDC	Village Conservation and Development Committee
ZAWA	Zambia Wildlife Authority
ZESCO	Zambia Electricity Supply Corporation Limited

## **Background**

Lake Tanganyika is an important social and economic resource not only to the communities immediately around it but also to those far away from it. Exploitation of lake Tanganyika resources is for subsistence, aesthetic and economic purposes. The fisheries categories practised in lake Tanganyika are subsistence, artisanal and industrial fisheries. Further to extraction of the resources, the lake is important for domestic water supply, as a receptacle for municipal waste and water transport system. It also offers an alternative recreation resource.

Lake Tanganyika, an East African rift valley lake, engulfed between Burundi, the Democratic Republic of Congo and Zambia, has been in existence for more than ten million years ago. Some of the lake's sediments date back to over twenty million years. The lake has a surface area of 33,000 square kilometres and an average depth of 600 metres with the deepest point being 1,500 metres. With a mean distance of approximately 750 kilometres and a mean breadth of 52 kilometres and total volume of 19,000 cubic kilometres of water, the lake represents a share of six per cent of the World's proportion of fresh water. A unique characteristic of Lake Tanganyika that distinguishes it from other fresh water lakes is the fact that it has exceptional biodiversity. The lake is in fact the second richest in biodiversity of all fresh water lakes in the world. Most of these are present in Lake Tanganyika alone and not anywhere else, i.e. they are endemic to this lake. There are 300 species of fish, of which two thirds are endemic to the lake. Scientists are discovering more new species continually. The *cichlidae*, which is the most successful family, has two hundred species of which all but five are endemic to Lake Tanganyika. The lake is also a natural habitat to the famous freshwater jellyfish and the endemic species of molluscs, crustaceans and two aquatic snakes. The portion of the lake that is in Zambia is 15 per cent in Mpulungu and Kaputa districts. The lake in Zambia has three islands namely Nkumbula, Sumbu and Mutendwe.

## **Introduction**

The Lake Tanganyika Biodiversity Project, has a span of five years from 1995 to 2000. It is a joint initiative of the four riparian countries that share the resource and mentioned in 1.1.1(3). The project office of administration is in Dar-es-salaam. There are four project offices in the lakeshore towns at Bujumbura in Burundi, Kigoma in Tanzania, Mpulungu in Zambia and Uvira in the Democratic Republic of Congo. Four other offices for national co-ordination are located in Bujumbura, Dar-es-salaam, Lusaka and Kinshasa. The aim of the project is to help riparian countries establish a sustainable lake-wide regional management programme for protecting and conserving the exceptional biological diversity of Lake Tanganyika. To achieve this object, the project set to produce two key outputs for sustainable management of Lake Tanganyika. These are the strategic action programme and the legal framework. In order to produce the Strategic Action Programme (SAP), the project identified, established and conducted studies in five areas of special studies. The purpose of these studies was to generate information to fill up the currently existing information gaps. The special study areas include biodiversity, fishing practices, pollution, sedimentation and socio-economics. In addition to the special studies, the project adopted a process of consultation called the Trans-boundary Diagnostic Analysis (TDA) that included formal assessment of problems and priorities. The TDA defines immediate management objectives within the overall aim of conserving the biodiversity of Lake Tanganyika addressing global concerns and ensuring the sustainable use of these and other resources for local communities and other users into the future.

### ***Socio-economic Special Study***

The socio-economic special study was aimed at exploring the state of the lake and thereby establishing baseline information.

The aim of the Socio-economic Special Study was to investigate the social and economic aspects of life around the lake and throughout the catchment area as a means to provide an understanding of:

- Current livelihood strategies and behaviours;
- The impacts of these on the biodiversity of the lake; and
- Ways in which these behaviours can change to reduce negative impacts on the biodiversity of the lake.

The understanding of the foregoing would provide an important input in the regional Strategic Action Programme necessary for Sustainable Management of Lake Tanganyika and its resources.

Although the special study also focussed on public awareness creation, the major thrust was twofold and aimed to:

- Conduct socio-economic dynamics of the lakeshore communities drawing on the disciplines of anthropology, rural sociology and economics; and
- Help strengthen community involvement in project activities.

### **Location and Population**

Lake Tanganyika and its catchment occupies the northern most tip of Zambia's Northern Province. It falls between latitude 8°8' and 9°45' south and between longitudes 30°00' and 31°40' east and also within the political boundaries of Mpulungu and Kaputa districts. Near the border with Tanzania and the entire eastern shoreline, the water body falls in Mpulungu district while the land falls in Mbala district. Figure 1.3.1 below shows the physical location of the lake and its catchment in Zambia. The Mambwe, Lungu and Tabwa ethnic groups represent the dominant ethnic groups in Kaputa and Mpulungu districts. These represent a proportion of 7.6, 5.8 and 2.3 per cent respectively of the total population in the province. At least 78.2 per cent of the people in Mbala and Mpulungu district speak Mambwe and Lungu while 61 per cent in Kaputa speak Tabwa. The other predominant language spoken is Bemba by 34.5 and 17.4 per cent of the people of Kaputa and Mbala/Mpulungu<sup>2</sup>, respectively. Further information for the rest of the ethnic groups is given in Table 1.3.1:

#### **Predominant Language of Communication in Kaputa and Mbala/Mpulungu**

Language	Kaputa	Mbala/Mpulungu
Mambwe	0.7	44.0
Lungu	1.3	34.2
Tabwa	61.0	0.7
Bemba	34.5	17.4
Namwanga	0.4	1.7
Tumbuka	0.3	0.3
Nyanja	0.2	0.3
Others	1.6	1.4
Total	100%	100%

<sup>2</sup> Mpulungu was in Mbala district in 1990.



Northern Province had a population of 855,177 in 1990<sup>3</sup> of which 441,909 are female and 413,268 are male. Northern Province has an area of 147,825 square kilometres giving a population density of 5.8 persons per square kilometre. The population of the three districts (Kaputa, Mbala and Mpulungu) surrounding Lake Tanganyika was 185, 984 representing a density of 5.6 persons per square kilometre. This population and density represents a population growth of -5.6 per cent compared to the 1980 census statistics. Table 1.4.1 shows the population dynamics of the three districts during the period 1980 to 1990.

**Population Dynamics of the Lake Tanganyika Districts from 1980 to 1990**

District	Population		Density		Growth rate
	1980	1990	1980	1990	1980-90
Kaputa	147, 593	49,993	3.4	3.8	-10.3%
Mbala/Mpulungu	81,291	136,091	6.2	7.3	5.3%
<b>Total</b>	<b>228, 884</b>	<b>185, 984</b>	<b>4.8</b>	<b>5.6</b>	<b>-5.0%</b>

The population of Northern Province is young with a median age of 16.2 years. Otherwise, 46.9 per cent of the population is less than 14 years old. There are two major settlement patterns in these districts. They are based on the local government structure under the guidance of the District Administrator and traditional structure under the rule of a Chief<sup>4</sup>. In the local government structure, people live in compounds in council designated areas. These settlements are usually well serviced with tap water, electricity, and other services such as education and health. They represent the urban<sup>5</sup> areas of the districts. Mbala is the most urbanised of all the districts and is some 60 kilometres on the south east of Mpulungu. Other urban settlements are at Kaputa and Mpulungu bomas. Kaputa is some 120 kilometres westwards away from the shore. Mpulungu is the only urban settlement that is on the lakeshore in Zambia. Another area but with a smaller population is at Lupili village in Sumbu in Kaputa district just on the shore of the lake. Traditional settlements are characterised by clusters of communities living together. There are currently 110 such clusters along the lakeshore and many away from the shore but within the catchment. The traditional settlements are headed by a village headperson with the authority of the Chief. Appointment of a village headperson varies with tradition and chieftdom. Usually but not always, the chief appoints a village head person. However, some headmen within the Lungu establishment are elected to their positions. The settlements are diverse in composition of ethnic groups, occupation and economic activities. But culture and traditional values, norms and beliefs are uniform within ethnic groupings.

***The Economy***

The three districts in which Lake Tanganyika lie exhibit characteristics of isolated areas of Zambia (SGS, 1999). An isolated area is one with untapped potential for economic growth because potential developers shun them for various reasons. The impediments to development are usually, but not always, physical. Relief features such as mountains, valleys, rivers, water bodies and swamps are key impediment. Others are long distances from commercial centres and the lack of good access roads, storage infrastructure, telecommunications and banking facilities. The area is representative of a typical area of less economic activity. However, small-scale subsistence farming, fishing and trading represent major economic activities. Cassava, sugarcanes, bananas, sweet potato, and maize are major

<sup>3</sup> Information based on the Census of population, housing and agriculture of 1990, Volume 6, Northern Province Analytical Report. The 1990 census statistics are the latest in Zambia.

<sup>4</sup> There are three Chieftains in the catchment area. They are Chief Name of the Tabwa, Chief Chitimbwa of the Lungu and Senior Chief Tafuna of the Lungu.

<sup>5</sup> By definition of the CSO, an urban area is one with a human settlement of 5,000 people or more.

crops grown by the majority of the people. The Lake Tanganyika fish harvests average at 14,452 metric tonnes of fish each year (CSO 1990).

### ***Administration and Services***

Not until after 1995, there were only two districts in the Lake Tanganyika catchment of Zambia, namely Kaputa and Mbala Districts. Mpulungu district became a district administrative centre after 1995. At each district, the District Administrator (DA) leads the district as a senior government official. Under the DA are district heads of departments responsible for local government and civic services, agriculture, health, education, home affairs including security and immigration, social and community services, wildlife and fisheries. In addition, other services are provided by non-governmental organisations such as the District Water, Sanitation, Health and Education (D-WaSHE) and the Hope Foundation. Private operators are also found mainly providing telecommunication services and production and marketing support to the small-scale farming sub-sector. Mbala district, the most urban of all is the best served in terms of communications and services and even private commercial activities. It is connected to Lusaka by air and a tar road that proceeds to Mpulungu harbour. The location of the airstrip at Kasaba mid way between Kaputa and Kaputa in the Sumbu National parks offers great opportunity for internal and external travel<sup>6</sup>. However, both Mpulungu and Kaputa have comparatively high potential for business development.

### ***Natural Resources and Energy***

The three districts are endowed with rare natural resources including the Sumbu National Park, Kalambo Falls, Kapisha hot springs and Kapembwa and caves. Some of these have been designated National Archaeological sites under the National Heritage and Conservation Act and are important potential tourist attraction centres.

The area is drained by Chisala, Lufubu, Izi, Lunzuwa, Luचेche and Kalambo Rivers all draining into the lake. There are three waterfalls each on the Izi, Lunzuwa and Kalambo rivers. The Lunzuwa falls is tapped for generation of hydropower for the Zambia Electricity Supply Corporation (ZESCO). Much of the vegetation in the catchment area represents miombo woodlands, a reasonable portion of which is protected under the forest act. The protected areas are Kambashi Local Forest No. 323, Lungu National Forest No. 16, Samfu National Forest No. 175 and North and South Lunzuwa National Forest No. 60. Protected areas under the National Parks and Wildlife Act are the Sumbu National Park, Kaputa Game Management Area No. 30 and Tondwa Management Area No. 29. Figure 1.4.1 shows South Lake Tanganyika and its resources. The current natural resource management policies emphasis devolution of power to local communities in a decentralised approach while embracing wider participation of women, men, children, private sector and sector integration in forest management. This is of importance because the majority of households depend on forests for fuel wood for domestic and other purposes.

### ***Development Projects***

Overall, there are very few development activities taking place in the catchment area of lake Tanganyika. These include construction of a road from Mbala to Kasaba bay in the Sumbu National Park. The project once complete will open the area to international communications especially when the facelift of Kasaba airstrip is completed. Some entrepreneurs have commenced construction of leisure resorts on the shores of Mpulungu for tourists and other

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<sup>6</sup> There are plans to upgrade the airstrip into an international airport to enhance the exploitation of tourism potential in the area.

visitors. There is one near Chippewa village and another near Kapoko village. The District Water, Sanitation, Health and Education Project (D-WaSHE) have also been conducting community projects in the area. The projects in the water sector are meant to alert people about sanitation, health and hygiene through education. The Food and Agricultural Organisation, supports a Project called Lake Tanganyika Research (LTR) Project. The Committee for Inland Fisheries Management in Africa (CIFA) has proposed to follow this up with another project for Fisheries Management. FAO is expected to execute the project while the African Development Bank will provide financing. The proposed project is expected to commence activities this year. Tondwa Game Management Area is under the Administrative Management Designed for community wildlife management (ADMADe). ADMADe is a national project that receives financing from United States Agency for International Development (USAID) mission office in Zambia. The focus is to encourage community participation in wildlife conservation while allowing for equitable benefit sharing by the communities affected and involved. From 1997 to 2000, LTBP conducted an environmental education campaign to create awareness on aspects of conservation of biodiversity as it relates to their livelihoods. As a result communities, in consultation with their traditional rulers, formed committees for conservation and development as a way of checking unsustainable fishing practices and promoting local initiatives of development. To date 60 Village Conservation and Development Committees (VCDCs) and 5 Stratum Conservation and Development Committees have been formed. A stratum committee is an amalgamation of an average of 10 VCDCs.

### **Methods**

A team of socio-economic personnel drawn from different departments conducted the survey in five villages. The names of the villages and dates of survey are indicated in Appendix III. Two approaches were employed. The first involved use of participatory methods and was applied to group meetings. The other involved household interviews aided with a question guide (Appendix II). The team had two community meetings in each village. There was one to mark the start of the survey and another to mark the end of the survey. During the first meeting the community with facilitation by team members, identified their functional social and community groupings. The major groups identified in all villages included Elders, Farmers, Fishers, and Women groups. In Lupili and Munshi villages, a group of traders or businessmen was identified. Later on the team held discussions with identified groups. The survey team conducted household interviews after community and group discussions. Interviews were conducted with selected households. At least 20 per cent sampling for household interviews was attained. See Table 3.1.1. After the interviews, the team prepared a summary of findings. These were presented to the last community meeting for information, verification or correction and endorsement.

### ***Choice of Study Sites***

The team identified the five study sites based on existing local knowledge of the lakeshore embracing the people, economy and accessibility. The choice was subjective with the intention of selecting typical sites as well as those with specific features of interest. Some of these features are involvement in agricultural activities, proximity to protected areas, recent influxes of refugees and cross border links. Other considerations were linkages with the LTBP, availability of social infrastructure such as churches, health centres and schools as well as presence of community projects and other non-fishery based activities. One site that was selected on the basis of its location away from the lakeshore could not be surveyed because of serious accessibility limitations by both land and water. All the sites selected either had one or more of the characteristics listed above.

### **Preparations**

Preliminary preparations involved the constitution of a team of personnel to conduct the survey. This was made up of personnel representing various government departments including the Department of Field Services and Fisheries in the Ministry of Agriculture, Food and Fisheries, Department of Education in the Ministry of Education, the Department of Community Services in the ministry of Community and Social Services and the Department of Wildlife and National Parks in the Ministry of Tourism. The constituted team reviewed and discussed the checklist for household interviews. Necessary modifications were made and a checklist of the kind presented in Appendix II was agreed and developed. The checklist is very similar to the one used in earlier socio-economic surveys of the lake Tanganyika shore communities. In addition, the team discussed the use of participatory rural appraisal tools. For every intended survey, an emissary of the lakeshore contact person from the Department of Fisheries was sent to inform the communities about the survey.

### **Results**

The survey was conducted in five villages representing four strata of the lake Tanganyika conservation and development committees. These were Chisanza A and Kapoko village near the Izi river mouth west of Mpulungu representing Stratum III, Kabyolwe village at the Lufubu river mouth in Stratum IV and Munshi and Lupili villages near Sumbu in Stratum V. An estimated total number of 416 people attended community meetings in all five villages. A total of 165 households representing 20 per cent of the total number of households were interviewed. A summary of the survey statistics is presented in Table 3.1 below.

#### **Summary of Survey Statistics**

Parameter	Name of Village					Total
	Chisanza	Kapoko	Kabyolwe	Lupili	Munshi	
Population estimate (No. Households <sup>7</sup> )	250	120	100	200	150	820
Attendance of Community meetings	89	42	35	150	100	416
Households Sampled	33	31	41	40	20	165
Per cent sampled	13.2	25.8	41.0	20.0	13.3	20.1

### **Socio-economic Dynamics**

#### **Population**

The indigenous populations of the Lakeshore are Tabwa and Lungu ethnic groups. The Tabwa people are confined to Kaputa district while the Lungu are confined to Mpulungu district. The Bemba people, from other parts of the province, have migrated into the lakeshore for business opportunities. Between Kaputa and Mpulungu districts, there is a high rate of in and out migration of the Lungu and Tabwa people. However, the Lungu remain dominant in Mpulungu district while the Tabwa dominate Kaputa district. The Fipa from Tanzania and Tabwa/Congo migrants from Congo have also settled in Mpulungu and Kaputa. Composition of foreign ethnic groups is higher, in the border villages than further in land. The composition of Congolese population at 25 per cent of the 35 people who attended the first community meeting at Kabyolwe was higher than expected. The Congolese stated that they came to settle in this part of the lake since 1964 when Chief Chitimbwa permitted them to do so.

<sup>7</sup> Figures on household size were based on either a combination or one of the following; community and group discussions, consultation of records held by village headmen and key informants such as medical personnel.

Migrations between Kaputa and Mpulungu are more regular than others. This became evident from the household interviews. At least 15 per cent of the interviewed households in Kabyolwe were Tabwa while even a bigger proportion of Lungu households were observed in Lupili. Most Tabwa immigrants in Mpulungu originate from Chishela in Kaputa district while the Lungu in Lupili originate from Mpulungu. The 1998 preliminary report of living conditions in Zambia indicate that migration to urban areas is still higher than to rural areas (CSO 1998). And within the lakeshore, areas that are remote have lower immigration rates than those that are not. The non-remote areas offer a better potential for both economic opportunities and social services. Therefore people tend to move to non-remote areas such as Mpulungu Central and Sumbu. This is particularly evident in Mpulungu where new buildings are rising and land disputes within the council area have started. On the other hand, the more remote seem to be experiencing a drop in population. This is inferred from the proportion of collapsed and abandoned buildings.

### **Households**

Men are the majority heads of households. A few cases in which women head households are those arising out of death of the husband. Extended family ties are very strong. Most (64%) households have an average size of 6 members. Polygamy is not a tradition in these villages but there is a high level of bigamy. There are 59 percent of bigamous marriages at Kapoko, 25 per cent at Chisanza and 13 per cent at Kabyolwe.

### **Housing and environment**

Less than 5 per cent of the houses are built with durable walls and roofs. Otherwise 100 per cent of houses in Kapoko and 80 per cent in Kabyolwe are made of un-burnt bricks. A further 20 per cent of the houses in Kabyolwe are built of grass thatches. And almost all houses in all the villages are built of grass roofs. Generally, the villages are very clean. They have a significant number of pit latrines but fewer have garbage pits. In all but Kabyolwe village, the number of households with pit latrines exceeds 80 per cent in each case. However, only 35 per cent of the households have garbage pits in Chisanza, about 20 per cent in Kapoko and less in Kabyolwe.

### **Livelihoods and survival strategies**

#### ***Wealth groups***

In every village, groups of elders, farmers and fishers discussed the general economic situation of their village. A summary of such discussions resulted in the conclusion that the quality of life in the village has deteriorated. Fish catches have diminished and the majority have no access to education, health, safe drinking water and productive resources. In all the villages wealthiest people are those with productive assets, specifically fishing gear. Owners of fishing nets, transport boats and out board engines belong to the first category of wealth people. In Munshi and Lupili businessmen are also in the first category of wealthiest people. In Kapoko and Kabyolwe, people involved in farming ranked in the first category of wealth people. Perhaps, this is because these villages are not fishing but agricultural villages. Households headed by skilled personnel along with people who own small pieces of fishing gear are placed in the second category of wealth. Households headed by females are the least wealthy. The female heads of households are either divorcees or widows.

#### ***Household economies***

The economies of the lakeshore communities are centred on farming and fishing. Almost all households are involved in one or more of these activities. On these activities are based dynamic, diverse and complex livelihood strategies. The communities spend their incomes on

a variety of needs - food, schools, health and re-capitalisation of their activities. In two villages, Kapoko and Kabyolwe a ranking of these expenditures was made and information in Table 3.2.1 below was obtained.

**Major areas of expenditure and percentage of households spending on these in Kapoko and Kabyolwe villages**

Major expenditure area	Kapoko	Kabyolwe
Food	100%	75%
Health	10%	5%
School	21%	10%
Re-capitalisation	17%	22%
Total cases studied	29	40

**Fishing**

Although fishing underpins the livelihood strategies in the lakeshore, not every household is involved. There are 32 per cent in Kabyolwe, 44 per cent in Chisanza and 69 per cent in Kapoko of households that are not involved in fishing. Lupili and Munshi villages are predominantly fishing villages with over 50 per cent of households involved. People involved in fishing varies from village to village, but they are all male. While in some villages, fishing is an activity of the elderly, in others it is perceived as an activity for the young. In Chisanza, adult men fish with small boys also involved to some extent. In Kapoko, fishing is deemed to be a young man's activity and in this village is carried about by the youth. The proportion of youthful to elderly fishers in this village during the survey was 8 to 1. Fishing is a complex activity with different individuals involved in different ways. The different levels of involvement are owners of fishing gear (example fishing nets), owners of lamps and light boats and hired labour. Available gear fishers used are seine nets, gill nets, lift nets and hooks. The use of beach seine nets<sup>8</sup> is being discouraged, it is perceived to be destructive. It destroys the habitats hence the diversity of fish types and catches immature fish including spawn. Fishing is done through out the year in all the villages. Previously fishing occurred in the dry season because fishing never existed as an exclusive activity to farming. The rainy season was reserved to agriculture and related activities. Another change in fishing practices is that lights make fishing possible at night. The fishermen fish with line or hooks throughout the year, with gillnets from July to March, with pulse seine nets from July to December and with beach seine nets from May to September and from January to March. This is summarised in figure 3.2.1 below.

**Seasonal fishing calendar by type of gear**

Gear used	M	J	J	A	S	O	N	D	J	F	M	A
Beach seines												
Pulse seine												
Gill nets												
Line fishing												

The types and quantities of fish caught vary with gear, season and location. Generally speaking, Kapenta is abundant in the dry season. Kabyolwe village has abundance of fish throughout the year but of varying types depending on season. Figure 3.2.2 gives information of common types of fish caught with different gears.

<sup>8</sup> All the three chiefs in this area have accented to this by putting in place regulations that ban the use of beach seine nets.

**Major fish types caught as a function of gear and season**

<b>Gear used</b>	<b>M</b>	<b>J</b>	<b>J</b>	<b>A</b>	<b>S</b>	<b>O</b>	<b>N</b>	<b>D</b>	<b>J</b>	<b>F</b>	<b>M</b>	<b>A</b>
Beach seines	<i>Kapenta, Pamba</i>								<i>Pamba, Nkupi, Nkungula</i>			
Pulse seines			<i>Kapenta, Pamba</i>									
Gill nets		<i>Mpande, Nkungula,</i>										
Line fishing	<i>Nkupi, Monde, Malembela, Lupapa, Nanyelele</i>											

It is common practice for fishermen to sell their catch to traders either locally or at the centres in Mpulungu or Sumbu. The catch is better sold fresh and is processed by the buyer. The buyers are diverse. In some villages, the fishermen sell the fish to their spouses and or children who dry and sell it to traders in Mpulungu. An equally large amount of fish is sold to Commercial Fishing Companies. These have freezing and marketing capacities at and beyond the lakeshore. Mpulungu is the biggest trading centre at which fish from all areas is assembled at Ngwenya market. Even fish from Tanzania and Congo are landed at Ngwenya for sale. In all the villages, people acknowledged that fish catches have been declining in spite of increasing effort. They claim that this is because fish stocks in the lake have declined. The decline of fish stocks is attributed to an increase in the types and numbers of more efficient fishing gear night fishing, commercial fishing activities, and year round fishing. People use to fish with nets made of natural fibre locally called Ntamba. This was dropped for the Lusenga net introduced by Tumba people from Tanzania. A Greek national introduced pressure lamps, hooks and fishing ropes, gill nets and seine nets at his shop in Sumbu. People recalled that long ago, fishing was undertaken during the dry season. There was no fishing at night either and fish caught was largely for subsistence and not commercial. To day fishing is done all year round and at night. There is a strong local belief that a break in the rainy season provided chance for the fish to breed.

The increasing numbers of fishermen and in particular commercial fishing companies is seen as the largest contribution to the declining fishery in lake Tanganyika. The felt view of the people is that, commercial companies not only fish all year round but also use superior gear and even go off the shore. The number of commercial fishing companies and vessels has respectively increased from 4 and 15 in 1970 to 6 and 30 today against a carrying capacity of 14. The beach seine is singled out as the most destructive gear on the lake. As it is pulled out of the lake, it sweeps the ground destroying habitats spawning ground including the spawn and immature fish. Furthermore, the net is prone to abuse with unlawful modifications that reduce the mesh to mosquito net size. Problems fishermen face are:

- Transportation on the lake is risky due to unpredictable weather;
- Lack of capitalisation to purchase motor boards and appropriate gear; Capital permitting, many fishermen would buy outboard engines to improve their performance. The engines are fast and can withstand some amount of turbulence. On the other hand capitalisation would allow them purchase gear such as gill nets, lift nets and others.
- Ngwenya Market authorities impose prohibitive landing fees on traders; each time they dock at Ngwenya market with merchandise, they are made to pay landing fees and fish levies. The fees are considered too high<sup>9</sup>.

<sup>9</sup> One fisherman of Lupili village stated that at ZMK 4,000 the fee is too high as it is not the only paid. Other are customs ZMK 10,000, levy ZMK 1,000. Add transport of ZMK 10,000 for the body and ZMK 5,000 per bundle.

### ***Farming***

Farming is perhaps the most important activity among the local communities in the lakeshore. In Kabyolwe, Kapoko and Chisanza respectively, 88, 100 and 73 per cent of households interviewed are involved in farming. More often than not, fishermen and traders are also involved in farming. In fact, some of the villages are strictly agricultural despite their being on the lakeshore. Kapoko is one such example where people carry their agricultural produce to Mpulungu for sale and occasionally exchange it for fish<sup>10</sup>. Even in Lupili and Munshi, where farming land is scarce, people move long distances in search of land for farming. In Sumbu some land 15 kilometres away from Lupili village has been set apart for people to grow crops. Farmer of Lupili village rent land from a private landowner for production of crops. They are charged not less than ZMK 50,000.00<sup>11</sup> per acre. The reasons for farming are two fold. Some is for sustenance as a source of energy and vitamins in their diets, while others farm for both sustenance and economic purposes. In some cases farming supplements the fish diets.

Crops are cassava, rice, pumpkins, yams, maize, sugar canes, beans, bananas, vegetables<sup>12</sup>, sweet potatoes, millet and groundnuts. Other crops are fruit trees, such as mangoes; oil palms, oranges, papayas and guavas are grown in the backyards. Fruits except mangoes in Kapoko are exclusively subsistence. Oil palms are processed into cooking oil most of which is used in the household. Cassava is the most widely grown important cash and barter. Cassava is the major staple consumed by more than 90 per cent of the households. The cassava is first soaked then dried and pound into cassava flour. Cassava flour is used for making *nshima*. Livestock production is limited to growing of chickens, ducks, goats and other small ruminants. There are no cattle farmers in the lakeshore. Farmers outlined the following constraints:

- Lack of adequate support infrastructure such as good road network to market centres;
- Lack of capitalisation in form of seasonal and other forms of support including fertiliser loans and marketing credit;
- Lack of extension facilities and information;
- Lack of facilities for handling perishable products such as mangoes and tomatoes which end up rotting;
- Crop destruction by wild animals such as monkeys, hippos and wild-pigs.

### ***Other Livelihood activities***

Trading is the third most popular of the economic activities practised in the lakeshore. Almost all households interviewed do one or the other form of trade. Over 60 per cent of households are involved in trading (100% in Kapoko, 72% in Kabyolwe, > 60% in Chisanza, Lupili, and Munshi villages). Trading terms are either cash or barter or a combination of both. Common items traded are agricultural commodities, fish, scones, beer, and others. Especially fish is bartered with cassava.

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<sup>10</sup> To demonstrate this is the fact that even the survey team could not find fish to buy for relish while in the village for the survey.

<sup>11</sup> Approximately USD 25.00

<sup>12</sup> Includes leaf vegetables, tomatoes and onions.



Trading is based on farming and fishing. The cassava is first processed and exchanged as cassava meal for fish, soap, salt and other essentials by approximately 84 per cent of producers of cassava in Chisanza. The transactions are done locally in the village or across in Mpulungu some 18 kilometres south-east.

In Kapoko and Kabyolwe cassava is either sold unprocessed from the fields or milled into flour. Cassava flour is either sold in Mpulungu or locally in the village. Transactions are made in cash or by barter where fish or crops are exchanged or for other commodities such as soap, salt, sugar etc. Both men and women practice trading together or independently. Usually women are more concerned with trade for family sustenance such as barter with groceries, salt, relish, and other commodities. Men usually concentrate on trade activities for higher income generation such as for procurement of productive assets. Incomes derived from selling cassava, trading and other activities vary with volume of sale. A comparative analysis for different crops was made for Kapoko. It was found that as high as ZMK 2.4 million<sup>13</sup> is possible per annum from selling of cassava. This makes cassava the most profitable crop. Other crops sold for cash or bartered for essential commodities are rice, sugarcane, millet, bananas, and sweet potatoes. Further details showing earnings from other crops among four farmers in the same village are in presented in Table 3.2.1 below.

**Total incomes in Zambian Kwacha (ZMK) earned from annual sell of crops in Kapoko village**

Crop	Farmer 1	Farmer 2	Farmer 3	Farmer 4	Total
Cassava	20,000.00	500,000.00	1,500,000.00	400,000.00	<b>2,420,000.00</b>
Rice	0.00	400,000.00	0.00	600,000.00	<b>1,000,000.00</b>
Sugar cane	1,000,000.00	0.00	0.00	0.00	<b>1,000,000.00</b>
Bananas	0.00	144,000.00	312,000.00	200,000.00	<b>656,000.00</b>
Sweet potatoes	0.00	0.00	0.00	200,000.00	<b>200,000.00</b>
Other	30,000.00	0.00	0.00	0.00	<b>30,000.00</b>
<b>Total</b>	<b>1,050,000.00</b>	<b>1,044,000.00</b>	<b>1,812,000.00</b>	<b>1,400,000.00</b>	<b>5,306,000.00</b>

Trading in the area is hampered by lack of adequate support infrastructure. Road and water transport are not reliable. The road network from Mpulungu to the outskirts is chaotic while transport on the water is slow and risky. The weather on the lake is not easy to predict. Paddling in rough tides is not easy. Occasionally, fatal accidents have taken place.

## **Government Services**

### ***Health Services***

In the villages surveyed, health facilities were only found at Lupili. Elsewhere people take their sick to Mpulungu usually by lake. Sometimes the people of Kabyolwe walk to the health centre at Iyendwe a distance of 15 kilometres, and people from Munshi take their sick to Lupili. Kabyolwe to Mpulungu is a 4 hours journey by boat. Travelling from Chisanza takes 45 minutes to Mpulungu while it takes about 30 minutes from Kapoko to Mpulungu by water. Generally the health facilities are inadequate. They either have no competent staff or no medical supplies. The women particularly complained about the uncaring attitude of some medical personnel. They complained about humiliations suffered in child labour at the hands of male persons. The labour room has no privacy. Everyone in the medical rooms hears the labour screams. The number of staff is not enough to adequately cater for the number of people they handle. For example at Sumbu as a case study there are four officers, a clinical officer, environmental health technician, laboratory technician and a nurse for over 15,000 people; 900 in patients and 600 out patients monthly.

<sup>13</sup> Approximately USD 968.

The D-WaSHE project has had interactions with the lakeshore communities sensitising them to sanitation and health issues such as prevention of diarrhoeal diseases rampant in this part of the country. As a result people are aware about most health matters especially those of sanitation, child immunisation, prevention of diarrhoeal diseases and disposal of domestic garbage. Due to lack of adequate health facilities people have resorted to herbs and traditional medicines. For those that can afford to travel to Mpulungu to buy any drug of their choice even without medical prescriptions<sup>14</sup>. Malaria and Diarrhoeal diseases are the major health hazards and killers. They have been associated with death in 41% of households in Kapoko. Child mortality is also high. It was recorded that 74 per cent of the households in Kapoko and 73 per cent in Kabyolwe experienced death of children below the age of five in the past 15 years. Miscarriages are common and were reported in all the villages. Women attributed miscarriages to witchcraft.

There is no supply of piped water in all the villages and safe domestic water in all the villages is negligible. Only in Sumbu, Kapoko and Kabyolwe have there been attempts to treat water by medical personnel especially after the cholera out break of 1978. Otherwise, most of the people, except for 24 per cent in Kapoko and 29 per cent in Kabyolwe drink untreated water from the lake or rivers or dug wells. The dug wells themselves are not protected. In one case in Chisanza animals also drink from the wells people drink from. And these wells have no water most of the time in the dry season. During the wet season water run off deposits sediments into the wells.

#### ***Agricultural Services***

There are no agricultural services for the farming communities in the lakeshore, perhaps due to the misunderstanding that people in this area are all fishermen. Extension services and relevant information on current technologies in farming, marketing and others are wanting.

#### ***Fisheries Services***

Most fisheries activities have been to enforce regulations. This makes fisheries officers appear like policemen. This alienates them from the public. The LTBP component of environmental education brought the two sides together by involving Fisheries officers in their sensitisation programmes for communities.

#### ***Zambia Wildlife Authority (ZAWA)***

ZAWA offers no services to the communities around the national parks. It polices the parks to ensure the animals are protected. However, problems arise in the boundary areas where the demarcations are not clear. People complain of harassment by wildlife officers when they collect firewood and fish in what they believe are not national parks.

#### ***Use of Natural Resources***

Natural resources found usable in the lakeshore communities were firewood, wood, grass, poles, wild-food including mushrooms and fruits, medicinal herbs, fibre, reeds and timber. Except water, all resources are collected from the nearby forests. In Sumbu firewood is collected from the National Parks on permission of the wildlife officers. Water is either collected from the lake or dug wells or sunk boreholes. Boreholes were found in Lupili village while dug wells were found everywhere. In Kabyolwe water is also collected from the banks of the Lufubu River. This source is thought to be safer than the lake. Men paddling

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<sup>14</sup> Any one in lakeshore communities can buy any medicine of their choice from drug stores without a prescription. There are no restrictions on type of medicines that can be bought this way.

canoes upstream collect water from this source. The natural resources are usually collected for domestic use. Occasionally households sell wood poles, grass and firewood. Firewood, grass and poles are the most sought and collected natural resources. The use of charcoal in the lakeshore is not common. The survey team only observed one case of a prosperous household that used charcoal.

Collection of water and firewood are women's activities. In some cases, men help out. In Kabyolwe, men help their spouses to collect firewood and water. They either escort them or do it alone. This is so because it is felt that the forests may not be safe enough so the men provide the needed security. Exploitation of poles and grass are men's responsibilities. In some cases women also help out particularly taking them to the homes. There is no gender differentiation in the collection of medicinal herbs. Any member of the household that knows what medicine to collect can do so.

Communities complained about long distances for collection of natural resources. They complained about harassment from the wildlife staff when they collect the resource from the *thought* national parks boundaries. In all cases people complained about lack of safe drinking water supply. They complained about the unprotected wells and springs in Chisanza and Kapoko respectively.

### ***Ranking of issues***

During the closing community meetings, ranking of topical issues was discussed and agreed. There were altogether 9 issues of importance to improvement of quality of life for communities. The first affect all villages while the last three affect only some villages.

- **Access to safe drinking and domestic water:** Water from existing sources is not safe. In some cases boreholes need to be sunk and chemicals for water treatment supplied. In other cases boreholes and wells already in existence need to be refurbished. In yet another situation, water points need to be protected with embankments to keep out run off and foreign materials.
- **Access to health services:** In some cases, the facilities are lacking and where they exist, they are not adequate. More personnel and drugs are needed.
- **Access to better education for children:** The existing schools in the villages fall short of the modern needs of education system. Buildings are collapsing and teachers are not enough. There are some villages like in Kabyolwe, where such facilities do not exist at all.
- **Access roads to marketing infrastructure:** This was considered an issue in all villages. They need all weather and passable roads to major market centres. These are roads to Mpulungu for Kapoko, Kabyolwe and Chisanza villages and to Kaputa and Mporokoso for Munshi and Lupili villages.
- **Access to productive assets (loans for fisheries and agriculture:** Communities need seasonal agricultural and fish loans to enhance their productivity. The loans would be for acquisition of equipment and where necessary farm inputs such as chemicals for use in production of vegetables. In Kapoko and Kabyolwe people expressed desire to access loans that could avail them with agricultural processing machinery such as grinding mills. In the same village people felt such assistance could also be used for procurement of an outboard engine to cater for transport needs of the people to Mpulungu.

- **Access to agricultural information:** Communities feel the authorities should introduce extension services for information on not only how to grow but also on markets. Currently efforts in crop production are farmers' own and the Department of Agriculture has done little to help.
- **Improved security and migration control:** This was a serious concern for people in Kapoko, Kabyolwe and Munshi. The entry and exit of foreign nationals should be checked to ensure maximum border security.
- **Access to land for agriculture:** People of Lupili and Munshi registered their desire to have access to agricultural land. Presently Land in the two areas is scarce. Much of it is under protection of the Zambia Wildlife Authority.
- **Access to veterinary drugs** came out in Kabyolwe village among poultry farmers.

## **Socio-Economic Issues and Recommendations For Action**

### ***Sustainable Fisheries and the Facilitation of Credit***

In general terms the aspects of developing a sustainable fisheries programme for lake Tanganyika should take into account the principles of environmental management to encourage the equitable sharing of benefits and participation of communities in management and decision making process.

Livelihoods are primarily based on the offshore fishery, the inshore fishery, and farming. The BioSS has shown that the biodiversity of interest is in the inshore area that it is already being heavily fished, leaving little capacity for expansion. There is a specific concern on the use of a beach seine net, which now faces a ban. Since the beach seine employs a large number of people from poorer households and provide these households with fish for consumption, trade, or even occasionally sale, it should be phased out as alternatives are phased in. This should be done in a participatory manner. Credit for fishing is not the panacea to the problem of conservation of biodiversity because the following associated problems<sup>15</sup>.

- “Natural” filling of capacity – the fleet has been expanding steadily for the past 20 years despite limited access to credit.
- Catamaran, lift net, outboard, anchor, lamps, etc. can amount to \$10,000, which is not “micro” credit. Anyone accessing such credit usually has collateral to start with, which that means they are likely to have other means of access to credit anyway. Less expensive gears are the ones LTBP is trying to reduce dependence on in the inshore zone.
- Piracy - issues of theft of gear as well as personal security are important to fishermen in the open waters. The SESS has found that piracy is attributed largely to people based in Congo. This problem is not going to be easily eradicated. As long as the current lawlessness in Congo continues, gear will continue to be stolen<sup>16</sup>. Repayment will then be impossible for anyone who has received credit, unless they have forwarded collateral, which they will then lose. If there is some leniency clause i) the credit will not revolve, and ii) there may be arguments over whether gear has actually been stolen or merely reported as such to evade repayments. This adds to a history of unsuccessful fishing credit projects in the region, many started for political reasons, without much expectation of repayment.

Therefore, an effective credit project to fishermen would involve simultaneous disbursement of credit and buy out and destruction of the old gear. This is to avoid passing on the old gear to other people. The buy out would reduce the amount of any loan, as the proceeds would be expected to go towards the new gear, but would be a onetime payment, not to be repaid.

### ***Farming, Energy Issues, Deforestation and Soil Conservation***

Soils erosion is an important factor in the conservation of conserving the lake's biodiversity. Erosion is caused due to unsustainable practices of agriculture and indiscriminate felling of trees for any purpose. Removal of wood biomass leaving behind grass and scrub is not as destructive as complete land clearing as in agriculture and late bush fires. It is recommended that investments be set aside for investigating and promoting sustainable management practices of agricultural lands through a deliberate extension effort. This could be through contour ridges, terracing, use of multi-purpose trees, grass borders, mulching, re-forestation, minimum tillage practices, organic farming, etc.) It is further recommended that lakeshore communities be supported in the establishment of grassroots level woodlots and protected woodlands and local initiatives to manage the use of wood resources.

<sup>15</sup> An extract from the SESS Advice Note to the SAP on problems with credit to support fishing.

<sup>16</sup> The lake is only 50km wide, a couple of hours boat trip with a good engine. The pirates are coming out of a war zone and are better armed than any marine police.

### ***Alternative Livelihoods, Activities and Practices***

The recommendation is that alternatives to fishing livelihoods that can increase the quality of life of communities equitably but do not lead to more erosion and sediment load into the lake should be supported. They could alleviate the reliance on, and thus damage to, natural resources. Similarly, activities that add value at the lakeshore to existing fish or agricultural production should also be supported. Activities that bring revenue to the lakeshore area from others, either within the country or even from abroad should also be encouraged, as well as those that redistribute wealth more equitably within lakeshore communities. A list of some of these activities includes:

- Promotion of non-wood forest/woodland products, particularly from a "rosary" of small village catchment protection areas.
- Examining solar hot air sardine dryers to produce a cleaner product, and perhaps even reduce loss from spoilage in rainy weather. This may have the additional benefit of increasing income (and reducing losses) of poorer households and women, who are more involved in traditional sardine processing.
- Investigation into improved fish smoking ovens.
- Examination of the viability of ice making businesses in urban areas and
- Improving land transport to markets for fish and agricultural products. Without this, the SESS has found that people are reluctant to diversify their farming activities, or even to aim to produce a surplus. This, however, must be planned to reduce negative environmental impacts, e.g., sedimentation during construction and subsequent erosion. An additional benefit of increasing mobility and communications with other parts of the country is that it facilitates entry into other sectors of the economy. However, it also facilitates access to the lake by outsiders in the event of recession, etc. in the rest of the country that may increase pressure on natural resources and thus impact negatively on biodiversity.
- Savings and micro credit projects to allow the poorest, particularly women, to establish the kinds of income generating activities which are already undertaken by the less poor in lakeshore communities, for example, baking, embroidery, beer brewing.

### ***Living Conditions and Gender***

Attempts to improve the living conditions should be supported. This could trigger reduction of population growth in the lakeshore. Population growth is one factor that undermines the efforts of conservation of the biodiversity. The project should further investigate the possibility of:

- Raising nutrition status by encouraging appropriate activities such as backyard poultry farming, small ruminants rearing (goats, pigs, rabbits),
- Improved access to clean drinking water, which would reduce the incidence of waterborne disease
- Improved sanitation including investigations on pit latrines and disposal of garbage. The additional benefit is improving people's productivity and reducing medical bills, and reducing nutrient load in the lake.
- Health education and improved delivery of health care services. This can also improve people's productivity reducing medical bills through education.
- Improved access to formal education. An investigation of pros and cons of community participation in the provision of primary education in the lakeshore should be investigated. This has the additional benefit of facilitating access to other sectors of the economy reducing pressure on lake and lakeshore resources, and providing a channel for environmental education
- Support to decentralisation of power to rural communities for resource management based on existing policies in forestry, fisheries and wildlife.
- Identification of gender roles with a view to removing imbalances against women in development programmes and environment management.

### ***Socio-economic Information Gaps***

Ideally a socio-economic survey is considered adequate when it covers at least 25 per cent of the target population. The selection criteria of the sample should be well thought so as to account for all variants. The catchment communities of lake Tanganyika can be described to be in two parts. One part is the lakeshore probably dominated by fishing as a major occupation. There is another outside the lakeshore and probably dominated by farming as a major occupation. The socio-economic studies focussed on investigating the situation in the lakeshore communities. This is the body of information summarised in this report. The wider catchment of the lake has been left unattended to. There is need to conduct socio-economic investigations in the wider catchment focusing on Fisheries livelihoods and practices; Agriculture; Natural resource use; and Population settlement and economic development.

## **Conclusions**

### ***Perception Problems***

The conservation of biodiversity is an activity that should be aimed at enhancing the quality of life of man on sustainable basis. Communities may shun any project that threatens their livelihoods so as any project that is seen to be against their social norms, values and practices. Taboos are normally not acceptable. This matters less no matter how restrictive the legislation to the current practice would be. Biodiversity conservation and poverty eradication cannot take place over night no matter how good the design of the project is. Their achievement relies heavily on the associated changes in behaviour of the affected communities. Change in behaviour is also a difficult result to achieve. It requires consented efforts in dissemination of information through all possible means to influence change. The process can be complex, simple in some cases long or even short depending society.

The problem with change is that it cannot be imposed on the people. The good things about it is that it can be persuaded. The persuasion process aims at building understanding of the communities as a way of winning their credibility for new activities. Therefore, the real need to forge ties with grassroots organisation, traditional rulers, community opinion leaders, innovators, change agents and such other social groups that can assist in influencing change. Usually outside developers in many a society are viewed with suspicion. Several questions arise in the communities. What is it that they have come for? Is it to help or to disturb source of livelihood? What is it that they want us to know that we do not know all the time we, and our forefathers have been living in this area? These questions in effect are a signal to any developer to realise that the level at which community and the developer perceives the problems is different. This is the more reason why local knowledge and participation in programme design, management and making of decisions should be an integral part of any development. There is no substitute for this.

### ***Information Gaps***

The recommendations made in this report are but a start of further work for a full understanding the lakeshore and wider catchment communities. Their sociology and economics need to be fully understood to ensure that any appropriate conservation projects initiated would be implemented within the social set up of the communities.

This report also realises that of the 110 villages in the lakeshore only five were sampled. The wider catchment was not even touched. This report cannot even guess how many villages and people live in the wider catchment and what their way of life and economies are like. It is concluded that these information gaps be reviewed through targeted action research. Investigations should be made emphasising the following: demography, education, housing and environment, Employment, and livelihoods. Needed is the following analyses of the households:

- How are people within households related,
- How and what do they contribute economically, and
- How does household size and composition vary amongst wealth groups,
- How do sources of income and expenditure priorities vary by type of household,
- How does education/healthcare/ sanitation vary by type of household



Further to the understanding of the households, the socio-economic studies would concentrate on isolating specific fishing gear and their effects on the livelihoods of the communities and biodiversity. Specifically the following aspects could be investigated:

- How many of each type of gear operate in an area,
- Who (what type of person) owns them,
- What is the capital investment involved,
- Who operates the gear (how many people are they),
- What are returns and how are they shared,
- What are the socio-cultural and economic values of the different fish species,
- How do they affect biodiversity of the lake

A survey into past credit schemes would be crucial to the establishment of the performance. If they succeeded what made them successful and if they failed why did they fail? Are some of the factors of either success or failure pertaining now and what effects would they have on a new scheme if there were to be one? What kind of persons benefited and what sizes of loans were involved? For the wider catchment it would be prudent to isolate the livelihood strategies and quantify their relative importance to the general well being of households. Investigations on who is involved, why are they involved, seasonal variations, coping ability, expenditures, support institutions, cross border implications and many would be vital. The very important issues of health, sanitation, gender, involvement of the youth and the service institutions such as non-governmental organisations would be integral to the study. Finally, the issues of household survival strategies, household composition and the economic value of children, the importance of trade and barter, and the prevalence of polygamy and the dependence of more successful household survival strategies on male labour in both fishing and farming would be worth of investigation.

### ***Use of Natural Resources***

Natural Resource Use in the wider catchment is an important aspect that would be investigated. Important questions to be answered would include the perceived value of forests by the communities, economic and conservative extraction of forest resources, community participation, and reforestation, forestation and agroforestry. Also worth of looking at is the identification of non-wood forest product of economic worthy such as caterpillars, mushrooms and any others that can be used as alternative sources of income.

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### **Dates and locations of surveys**

<b>Dates</b>	<b>Name of village</b>	<b>District</b>
October 11 – 13, 1999	Chisanza `A`	Mbala
December 11 – 15, 1999	Sumbu Lupili	Kaputa
December 16 – 19, 1999	Munshi	Kaputa
February 12 – 16, 2000	Kabyolwe	Mpulungu
March 12 – 17, 2000	Kapoko	Mpulungu