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FISHING PRACTICES SPECIAL STUDY (FPSS)

SURVEY ON FISHING PRACTICES AND RELATED SOCIO-ECONOMIC ASPECTS AT UJIJI, KATONGA AND KASEKE (TANZANIA, KIGOMA REGION)

February 1997

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)

Le Projet sur la diversité biologique du lac Tanganyika a été formulé pour aider les quatre Etats 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 GEF (Fonds pour l'environnement mondial) par le biais du Programme des Nations Unies pour le développement (PNUD)"	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.

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1 INTRODUCTION, MATERIAL AND METHODS

This survey is a continuation of another survey done by the Lake Tanganyika Biodiversity Project at the Northern fishing village of Mtanga (see FPSS report). The aim is to examine the impact of fishing activities on the environment surrounding the fishing communities along Lake Tanganyika, and the Lake shore villages.

Ujiji, Katonga and Kaseke are fishing centres located near Kigoma which is the main Tanzanian port along Lake Tanganyika. Population in these centres is big compared to the utilised resources. Since most of this population is depending on fishing and other related socio-economic activities, the survey is geared to the assessment of the socio-economic activities and their impact to the natural resources.

The survey started in the first week of February and ended on 28th February 1997. There were four members in the team which concentrated in two areas: fishing Practices and the related Socio-Economic activities.

1.1 Hypothesis

Before the survey the team's thoughts were:
- Some fishing methods practised in the lake are destroying fish breeding areas;
- Some of the fish processing methods are causing deforestation along the lake; and,
- Poor farming methods could be a source of erosion and siltation within the lake.

1.2 Objectives

In order to evaluate the above hypotheses, the team had the following objectives:

- to find information on how the fishermen secure fishing gears;
- to observe the fishing methods applied, problems caused and measures taken to overcome or tackle those problems;
- to evaluate the division of income between the owners of fishing facilities and their workers (fishermen);
- to examine the knowledge on how fishermen differentiate fish species, male and female fish;
- to find out the indigenous knowledge on how to detect the better catch area (tracing the direction of fish);
- to examine and observe the fishing methods used in these villages;
- to get general views from fishermen and fish processors on the conservation of water and land (environment);
- to get their view on whether they are aware of the impact of the fishing practices to the environment; and,
- to examine farming methods practised.

1.3 Technique used to collect information

The survey team had been planning to visit one fishing centre once a week making the total of four visits per centre for a month. The team visited Kaseke, Ujiji and Katonga alternately. They made direct observation and informal discussion with the fishermen, fishmonger (traders), fish processors and owners of the fishing gears/facilities.

2 RESULTS

2.1 Fishing calendar:

The fishing calendar is almost the same in all three stations. According to the fishermen, the fishing calendar is dependent on the catch rates, i.e. nobody holds a meeting to plan the fishing calendar. There are months when fishing activities are reduced due to poor catches, particularly from May to July. This is due to the fact that this time the water column is homothermal down to 60 m and beyond as stratification partially breaks up. This allows fish to disperse over a longer water column because of the uniformity of temperature and oxygen concentration.

FISHING PRACTICES AND FISHING SEASONS-TIME FOR HIGH CATCH AND LOW CATCH

Fishing Method / month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Lift net (KIPE)												
Beach seine (KOKORO)												
Gill net (MAKILA)												
Ring net (MTIMBO)												
Hand lines (KACHINGA)												

High catch season
Low catch season
Very little or no fishing activities

The chart shows that fishing activity is reduced in May-July.

There is a high catch during the heavy rain seasons beginning in December and ending in April. At this time fish are attracted by the zooplankton eating phytoplankton found over the lake during the rain season. Fishing is temporary closed for a week every month because of the moonlight. It is only longline fishing that is done throughout the year.

Time for average catch
This time benefits the fishermen because price is good compared to the time of high catch. Many fishermen depend on this time as most of them get something to sell for good prices.

Time for High Catch
During this time it is not the fishermen who benefits much but the consumers. When the catch is high price goes down. Fishermen get more catch but little money. Consumers pay less for many fish.

2.2 Fishing gears / facilities

There are different sources and means by which fishing facilities are obtained:

- Few fishermen who are well-off, buy fishing facilities and fishing gears themselves. Most of them are the fish traders who have raised funds by buying and selling fish in the neighbouring countries.

- Others were credited by the financial Institutions mostly by The Cooperative and Rural Development Bank (CRDB). Credits are received in the form of fishing nets, engines, pressure lamps and cash. In this group there are those who received the loan when they were already owning other fishing facilities. The loan is therefore used in buying what is missing. These are able to run fishing activities themselves.

- Others received loan in the form of fishing gears but They are not able to use them alone because they are not complete they therefore, join those who have complementary facilities to form complete fishing units.

- Few of the owners inherited fishing facilities from their bereaved relatives.

2.3 Overview of fishing practices at Ujiji, Kaseke and Katonga

At Ujiji fishing methods observed include beach seines (which is highly practised), gill nets, longline and “Mtimbo” ring-nets. Lift nets are rarely used because of the extended shallow water at the beach. The beach is located near the mouth of Luiche river. “Mtimbo” fishing practice is the same with a beach seine (observed also at Mtanga where light is used to attract fish). The different between Mtimbo and beach seine is that hauling operation for “Mtimbo” ends in water, while with beach seine, hauling is done at the beach. In this case Mtimbo is a selective method. It catches deep water fish and not shallow water fish at the beach. Most of the fishermen said that fish caught by this method are adults. In this system light is not used; instead they follow fishermen with lift nets. It also requires little manpower of about three people. ”Mtimbo” method is said to originate in Burundi.

At both Kaseke and Katonga beach seine fishing method is not commonly practised nowadays. We only managed to observe one beach seine operating at Kaseke. During our survey there were about fifty five (55) catamarans for lift net method. Twenty (20) belonged to Kaseke's residents while 35 belonged to fishermen from other villages, including refugees from Burundi and Zaire.

Most of the species caught in the two stations (Kaseke and Katonga) by lift nets are ***Stolothrissa tanganicae*** and ***Lates stappersii*** (Migebuka). With beach seine, gill nets and handline, multi-species fish are caught. During the survey days there were a high catch at Kaseke according to the fishermen and fishmonger. Average price for ***Lates*** was 12,000 Tsh per 50 kg box. ***S. tanganicae*** was also selling the same price per box.

2.4 Hand-line Gear

Through observation, we found that handline method of fishing is mostly practised by young fishermen (Ujiji). They use dugout canoes for fishing. Through discussion they said that two fishermen can join together to buy a boat. The boat is shared but each one has to buy his own lines and hooks according to his ability. Income of each fisherman will depend on his struggle to get good catch for selling.

We were told that a single boat can cater for more than ten lines of 100 m each. Each line carry one hook. A line cost 1,000 Tsh each. The price for one hook is 200 Tsh. In general, fishermen said that a total of. 50,000 Tsh can be enough capital for this type of fishing practice. When asked whether they can get this amount they said that it is not easy for an individual to get that amount unless they join in groups of two or three people. Handline fishing gear is somehow comparatively cheaper for the fisherman. It is only the boat that costs much. It is mostly used by the fishing community as a means of getting fish for food. It is mainly used at time when fishing by other gears is almost stopped, that is May, June and July. This is the time when there is a high demand of fish

because the most common lift net method is reduced. Handline is operated throughout the month ***i.e.*** when there is a moonlight and when there is no moonlight.

2.4.1Durability

The survey discovered that handline can stay for more than two years if there is no any destruction. The destruction they mentioned was losing and bending of hooks that is mostly done by large fish that are heavy for the hooks to hold. These type of fish can some times cut the lines. Handline gear gets high catch during the time when there is cold weather in the above mentioned months.

2.5 Beach Seine

Beach seine fishing gear is more expensive compared with other fishing gears practised in this area except lift nets gears that are more expensive. Few fishermen afford to buy the gear. The maximum length of a beach seine net is 800 m and minimum is 100 m. The common mesh size is 2.5 inch. Fishermen said that it is possible to get larger sized mesh as they had seen them in Burundi. Beach seine operation needs big manpower beginning from ten people onwards. Like « Gill-nets » and « longline », beach seine fishing method is not seasonal. It can operate through out the year and any time of the day providing that there is no bad weather in the Lake. When asked for a price of a beach seine gear, they said that a beach seine gear with minimum length cost about 700,000 Tsh.

2.5.1Availability

According to the fishermen interviewed, beach seine fishing gears are not available nowadays. They therefore make them locally by modifying lift nets into Beach seines. They do this because lift net operation needs engines while with beach seines they can operate without engines. In order to reduce the cost of buying engines, they modify lift nets into beach seine gear.

2.5.2Fishermen Recommendations

- When asked whether they are aware of the effects of beach seine gear or other gears, they said that it is a destructive method of fishing because it catches all that comes in its way, including juveniles and fish eggs. They admitted that they had observed this during their operation but they cannot stop it as they are mainly depending on beach seine fishing gears for their daily livelihood. Most of them cannot afford to operate lift nets. “To stop beach seine fishing is like ruining our own lives”, they insisted.

- Fishermen asked the scientists concerned to innovate other fishing gears which are not destructive and affordable to replace the beach seine.

- Revolving fund should be allocated to the fishermen who are not able to purchase the recommended gears.

2.6 Lift nets

Lift nets are commonly used at Kaseke and Katonga. Lift netting is mostly done in offshore waters for catching schools of fish. The fishermen therefore use engines to reach there. The surveyor discovered that the operational cost of lift net is very expensive compared to other fishing gears.

It needs two boats, an engine, the lift net itself and pressure lamps. According to the Co-operative Rural and Development Bank (CRDB) data, the minimum capital needed for a lift net operation by 1996 was about 1.9 million shillings. A lift net of 300 m, 2 ropes and six pressure lumps cost about 596,000 Tsh An engine of 25 H.P. cost about 1,000,000 Tsh. Two boats used in the operation cost about 150,000 Tsh each. Because of the low income among the fishing communities, few of them afford to get a capital for lift net operation. Those who own lift nets are classified as rich men in the fishing community.

2.6.1Durability

Fishermen said that it can stay for about 10 years if it is handled with great care. There are two type of catamaran boats used in the lift net operation; one type is known as ordinary catamaran which is common in the area. An average of 4-8 pressure lumps are used in the operation. With advanced catamaran which originated in Burundi an average of 6-12 pressure lumps are used. It has a large fishing net with two poles ranging from 19-25 m long (locally known as « Apollo »). In this type fishing occupies a very big area compared to the ordinary catamaran. Fishermen said that they were formally using trimaran but they decided to reduce the number of boats while maintained the size of the net. Thus they use two boats of lengths varying from 8.65-10.5 m long and a width of 1.6-1.9 in. The Apollo uses six fishermen. Few fishermen practice advanced catamaran because they said that it is more expensive.

2.7 Gill Net Fishing

Gill net is not highly practised but it is at least found in all of the three stations-Kaseke, Katonga and Ujiji. Gill nets used in these areas vary in their mesh sizes according to the desire of the fishermen. Mesh sizes range from 2.5" to 6".

2.7.1Operational Cost

Gill net gear with a minimum length of 300 m costs about 100,000 Tsh. It also needs a dug-out canoe, the most used craft by the fisherman in this operation. The price for a dugout canoe differs from the sizes and the type of wood used, but it cost 21,000 Tsh and above. The maximum manpower required in the gill net operation is three people.

2.7.2Durability

Gill nets can stay for about a year if handled with care and it also depends on the ply of the net. It is sometimes destroyed by engine boats, big fish and sometimes it is stolen.

2.8 Indigenous knowledge of fish species and gender

Most of fishermen interviewed said that it is sometimes difficult to differentiate the male fish from the female fish in most of the species found in their area. However, they can easily identify male and female fish in some species like ***Tylochromis polylepis***.

One method is by using colours. They said that in some species like ***Tylochromis polylepis*** male have a colour linings or rings on their outer shells while female do not have colours. To prove the method, we took a sample of the mentioned species and examined in the TAFIRI laboratory but the result was opposite. Another method mentioned is by pressing the fish abdomen towards the anal fin. By doing this, an adult female fish would release eggs, grey or yellow fluid. Male fish would release while fluid.

When asked to tell us how do they detect the movement of fish, they said that they watch bubbles on the water surface. ”We can stay for about 20-30 minutes while detecting the presence of fish before we begin to set the net in the water “ said one of the fishermen. If there are bubbles coming up from water they know that there are fish in that ground. Fish like ***Lates stappersii*** sometimes jump out of water.

3 ECONOMICS

3.1 Income distribution

Fishermen have their systematic ways of dividing their income. They accumulate all daily income for a duration of one month. After a month they divide the amount into three parts. First, they separate the operational cost (for the next fishing season). The remaining amount is divided into two, one for the owner of the gears and the other half is for the fishermen. Fishermen distribute their half equally among themselves. Income for a single fisherman per month depends on the fish availability and it varies from month to month or season to season. As an example a fishermen can get about 5,000 Tsh per month if the fishing is poor, 60,000 Tsh in the average fishing and about 150,000 Tsh per month when fishing is good ***i.e.*** there is high price of fish and fish are available.

3.2 Fish processing

There were two fish processing types in the areas surveyed: processing through sundrying that is commonly used to process small fish like ***S. tanganicae, Limnothrissa miodon*** and juveniles of ***Lates stappersii.*** There is also fish smoking by using firewood. This type of processing is not so much practised here as it is in Mtanga or other villages along the lake. At Ujiji and Katonga fishmongers and processors said that they have permanent markets for fresh fish, thus they don't need to smoke them. They only smoke fish when all the catch cannot be sold (mostly occurs during heavy rain season).

At Katonga there is a market for fresh fish. Many people from Kigoma Town and neighbouring places come to buy fish here for consumption and business. The buyers transport fish in different ways. Some use minibuses travelling between Kigoma town and Katonga, some hire motorcars to send fresh fish to far distances like Kasulu, Manyovu, Bitale, etc. Others use bicycles and the rest carry it on their heads.

Fish is sold in boxes. When the price is high, three or more than three fish mongers and processors contribute to buy a box of fish and share it according to the amount he / she had contributed.

3.3 Other economic activities

Apart from fishing activities, the fishing communities participate in other income generating activities such as farming, business and other petty businesses.

3.3.1Farming

At Katonga and Ujiji crop farming is done on a small scale along the Luiche Valley, following the shortage of land, as these centres are part of the Kigoma town where the population is big compared to other fishing centres along the Lake. They mainly depend on the palm oil trees that are the dominant plants along the Lake. They formerly processed (extracted) palm oil by using fire wood from the near by forests. Nowadays they use palm oil trees residuals for processing due to the shortage of firewood in the area.

Farms are not close to the lake. Major crops at both UJIJI and KASEKE are palms, maize, beans and cassava. Most farms are owned by men. However women are the major workers in these farms. They do weeding and harvesting. Beans and maize are just for consumption while palm oil is for both consumption and sale. MAWESE (Palm oil) is a Swahili name. The main cooking oil in KIGOMA region is extracted from the

palms. Women harvest and process the oil. They do it locally or sometimes take them to the small processing factories in KIGOMA town. The permanent palm oil crop is the best income generator in the area. A tin of 20 litres of Mawese is sold for 6,500 to 8,000 Tsh. The interviewees could not say how many tins could be produced by one tree.

Distribution of products: women interviewed said that men are not doing farm work because most of them are spending their time in fishing and business. However they said that there are men who get large shares of the farm products. Women are only allowed to take a quarter of palm oil products for home use and the remaining three quarters are for men.

Women showed their discontent with the nature of labour and products distribution. They said that many men in the area are polygamists with more than one wife. They are sometimes using the money brought by another wife's labour to benefit the second or third wife who has never worked for that money. Women said that, in order to solve the problem, they prepare their own palm oil farms if they happen to get money. the aim of doing that is to be free from men domination.

3.3.2Selling of food

There is a food business known locally as "Mama Nitilie" in both KASEKE and UJIJI. These are women cooking food at home and carry the food to the beach and fish marketing areas for sale. They mostly cook rice, beans, meat, fish and tea. Few men operate temporary built cafes selling the same type of food.

Others sell local brew ("Kayoga"): which is made with bananas and maize. It is the dominant liquor in the two fishing stations UJIJI and KASEKE. Kayoga is a local name for this brew which is sold in the individual huts and local bars. The alcohol drunk is brought from the nearby highlands. Most of the Fishermen said that their means of recreation were by drinking alcohol after working hours. They say that a cup of Kayoga keeps them fit for the following day's work. Kayoga is prepared daily and sold in great quantities.

3.3.3Selling of second hand clothes,

Known as "Mitumba", second hand clothes are worn because they are cheaper than new ones. "Mitumba" traders buy them in town and bring them to the fishing communities where they sell them in temporary built stalls and in the market area. These traders are the youths who live in these communities and some others who come from various areas.

3.3.4House leasing

Houses at KASEKE and UJIJI differ a lot. UJIJI being the old town, houses there though old are permanent ones. As most fishermen are moving from one beach to another, following the fish, the owners of the houses get money for leasing houses to them. They normally lease one room for 300-600 Tsh per month. At KASEKE there are both temporary and permanent houses. Temporary houses are built with mud bricks and grass roofs. These houses are leased to the fishermen, refugees or traders. They are leased by the residents. Few permanent houses within the fishing communities are owned by the owners of fishing facilities and/or businessmen. At UJIJI, the rate can be as high as 1,000 Tsh per month.

3.3.5Work on fishing gears

People in UJIJI, KATONGA and KASEKE earn their living building boats or repairing them. Some other people work on the fishing gears themselves like net mending or braiding. "I am getting money from braiding nets for Mtimbo. Nets with mesh sizes of 2.5

inches used for Mtimbo are not available here in KIGOMA. Thus Fishermen buy spools of twine and give them to me for braiding their nets": "I am spending two days for braiding one spool of twine. For every spool I am paid 1,000 Tsh. A complete Mtimbo is consisting of 36 spools, i.e. the owners of the fishing gears pay me 36,000 Tsh for construction of one Mtimbo gear".

3.3.6Social services at KASEKE

The total population of KASEKE is about 6178. From the figure there are 2959 Children and 712 handicapped and disabled old people.

There is a Health centre and a primary school. Three NGOs have contributed to the development of this centre. They are KIGOMA Development Programme (KIDEP), TACARE and Cooperative Rural Development Bank (CRDB). KIDEP rehabilitated the Primary School and constructed water pumps with five tapes from Nyamkonda River to the Centre. TACARE have been motivating tree planting in the area since last year. CRDB and F.A.O. Fisheries project have been giving loans to the Fishermen in form of fishing facilities. Fisheries Officers secure licences and supervise Fisheries regulations. They also provide technical advice to Fishermen but they are not present at every fishing station.

4 GENERAL FINDINGS

- The impact of fish processing to the environment in these three centres is less than that of Mtanga. This is because of the permanent fresh fish market provided by the Kigoma town population. They rarely process fish during the rain season when there is high catch

- Being close to Kigoma Town, crop cultivation is practised in small scale at Ujiji and Katonga. Kaseke farms are far from the lake shore. More investigations should be done to see whether there are farming systems that allows siltation to the lake, as the team did not visit the farms.

- Tree planting efforts should be insisted at the fishing communities as they need them for fish processing and other uses.

- Education on environmental conservation should be given to the fishing centres as nobody has done it within the surveyed centres.

5 WORKPLAN FOR FISHING PRACTICES AND SOCIO-ECONOMIC SURVEY

UJIJI - FEBRUARY 1997

Date	Place	Nature of work
04.02.97	KASEKE	Sampling and Interviews
05.02.97	UJIJI	Sampling and Interviews
06.02.97	TAFIRI	Laboratory analysis, Computer data entry
07.02.97	KATONGA	Sampling and Interviews
10.02.97	KASEKE	Sampling and Interviews
11.02.97	TAFIRI	Laboratory analysis, Computer data entry
12.02.97	UJIJI	Sampling and Interviews
13.02.97	TAFIRI	Laboratory analysis, Computer data entry
17.02.97	KATONGA	Sampling and Interviews
18.02.97	TAFIRI	Laboratory analysis, Computer data entry
21.02.97	KASEKE	Sampling and Interviews
24.02.97	UJIJI	Sampling and Interviews
25.02.97	TAFIRI	Laboratory analysis, Computer data entry
26.02.97	KATONGA	Sampling and Interviews
27.02.97	TAFIRI	Laboratory analysis, Computer data entry
28.02.97	KASEKE	Sampling and Interviews
March-April	TAFIRI	Report writing