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FRAME SURVEY RESULTS FOR THE TANZANIAN COAST OF LAKE TANGANYIKA, MARCH 1995, AND COMPARISON WITH PAST SURVEYS

by

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FINNISH INTERNATIONAL DEVELOPMENT AGENCY

FOOD AND AGRICULTURAL ORGANIZATION OF THE UNITED NATIONS

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PREFACE

The Research for the Management of the Fisheries on Lake Tanganyika Project (Lake Tanganyika Research) became fully operational in January 1992. It is executed by the Food and Agriculture organization of the United Nations (FAO) and funded by the Finnish International Developmental Agency (FINNIDA) and the Arab Gulf Programme for United Nations Development Organizations (AGFUND).

This project aims at the determination of the biological basis for fish production on Lake Tanganyika, in order to permit the formulation of a coherent lake-wide fisheries management policy for the four riparian States (Burundi, Tanzania, Zaïre and Zambia).

Particular attention will be also given to the reinforcement of the skills and physical facilities of the fisheries research units in all four beneficiary countries as well as to the buildup of effective coordination mechanisms to ensure full collaboration between the Governments concerned.

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SUMMARY

In March 1995, 45 beach recorders from the Tanzanian Fisheries Department, Ministry of Tourism, Natural Resources and Environment, conducted a fishing village frame survey (FS) at the Tanzanian coast of Lake Tanganyika with help of LTR. Results were compared with historical data from annual statistics reports by the Fisheries Department.

The Tanzanian fleet consisted of 3,009 vessels in the Kigoma Region and 1,853 vessels in the Rukwa Region. In both regions there were approximately 76.2%, 20.4% and 3.5% (3,707 and 991 and 168) of fishing vessels, auxiliary boats (light boats) and transport vessels respectively. Fishing by wooden/planked canoes, catamarans, dugout canoes, trimarans and industrial units was 60.3%, 25.4%, 12.3%, 0.4% and 0.1% (2,834 and 1,194 and 577 and 19 and 4) respectively.

The traditional fishery employed 6,747 hand lines, 2,917 gill nets, 410 long lines and 271 scoop nets. The artisanal fishery employed 1,158 liftnets, 496 beach seines and 4 Apollo liftnets. Four industrial units were observed. The highest concentrations of liftnets and industrial units, 760 and 3 respectively, were in the Kigoma Region. The highest concentration of beach seines, 280, was in the Rukwa Region.

Historical data as estimated from FS were available for the period 1967 to 1995. Between 1971 and 1983 the fishing fleet increased in size. From 1984 to the present the number of fishermen remained relatively constant, on average 13,760, but at a lower level than in 1983, 16,558, while the number of fishing vessels declined rapidly to a value employed before 1972. These observations probably reflected the change from a fishery mainly based on traditional fishing methods, using one boat, to one predominantly based on artisanal fishing methods utilizing catamarans. In particular the use of traditional scoop nets and gill nets declined to 5% and 7% respectively of the maxima recorded in the last 22 years. The employment of artisanal liftnets has steadily increased since the first records in 1977.

Incomplete, historical data as estimated from CAS were available for the period between 1950 and 1992. The total catch increased rapidly during 1983-1985 (on average 107,143 MT per year) to more than twice the total annual weight caught in 1978-1982 (on average 41,418 MT per year). This was caused in particular by the expanding artisanal fisheries. The contribution of the total industrial catch during these years was negligible, <0.5% of the total catch. The following recommendations are made:

- 1. a different CAS system should be used,
- 2. the annual statistics report by the Fisheries Department should be more specific, the type of fishing vessel and the number of fishing nights per type should be given,
- 3. the Fisheries Department should collect data on annual catches from industrial fishing companies operating on Lake Tanganyika and
- 4. an adequate budget should be available for Tanzania to carry out monthly CAS and annual FS.

1. INTRODUCTION

1.1 Lake Tanganyika

The lake surface is situated at an altitude of 773 m, is 673 km long and has a maximum width of 48 km (Fig. 1). The mean depth is 570 m with a maximum of 1,470 m and an estimated water volume of 18,800 km³. Lake Tanganyika is the deepest tropical lake. The lake is shared by four riparian states, Burundi, Tanzania, Zaïre and Zambia.

The Tanzanian shoreline is 669 km long, 36% of the lake total (Hanek *et al.*, 1993). It is shared by two administrative regions, Kigoma Region in the north and Rukwa Region in the south (Fig. 2). The coastline of Kigoma Region is 312 km long, 47% of the total Tanzanian coast, and has only one district, Kigoma, bordering the lake. The remaining 357 km, 53%, belong to Rukwa Region which has three districts bordering the lake, Mpanda, Nkasi and Sumbawanga.

1.2 The fisheries

There are three types of fisheries in the Tanzanian waters of Lake Tanganyika (Hanek *et al.*, 1993) (Fig. 3):

- (a) the traditional fishery employing lusenga or scoop nets, gill nets, long lines, hand lines and traps;
- (b) the artisanal fishery employing liftnets, beach seines and chiromilla seines (the artisanal seine); and
- (c) the industrial fishery of which a single unit is made up of a steel purse seiner and 3 to 5 small light boats (the total crew of the unit may be 20-40 fishermen).

All liftnets and most seines are fished at night and the fishermen use lights as attractants. The beach seines along the north and middle shoreline of the lake are the only seines operated during the day. In the south of the lake, these fishing gears are used during the night with lights attached to buoys.

Marketing of catches in excess of local needs is difficult because of poor transport facilities between communities along the lake (Katonda and Kalangali, 1994) as there are very few roads linking the scattered populations (Fig. 4). Water transport is carried out by large, plank built canoes powered by outboard engines and there is a service several times a week by two large transporter/passenger ships (M/V Liemba and M/V Mongozo).

1.3 Status of the statistical information system

The Fisheries Department, Ministry of Tourism, Natural Resources and Environment, is the body responsible for fisheries management and conservation in Tanzania (Coenen, 1993). Annual reports summarize the fisheries statistics from all fisheries of Tanzania. At the first Fisheries Statistical Coordinators Meeting for Lake Tanganyika, 12-13 December 1994, Bujumbura, Burundi, the statistical information system in Tanzania up to 1992 was

considered to be satisfactory (Coenen, 1994a). It consisted of regular catch assessment surveys (CAS) at the landing sites as well as annual fishing village frame surveys (FS) which were conducted in November and December (Katonda, 1994). In December 1992, a new fisheries statistical system, based on two similar survey types, was introduced by the UNDP/FAO Fisheries Statistics Project URT/87/016 to improve fisheries data collection and analysis (Katonda, 1994). In the new system, the fishing village frame surveys are conducted only once in every two to three years (Coenen, 1993). The last FS, before 1995, was carried out in December 1992. The introduction of the new system was accompanied by several limiting factors including a small budget which did not allow for adequate manpower, the reduction in numbers of personnel due to a general reduction in the total number of civil servants and a redistribution of the remaining staff to other duty stations (Coenen, 1994a; Katonda, 1994). In addition, the new CAS system required the complete enumeration of all fishing units arriving at the landing sites. This task proved to be impossible at large landing sites (Coenen, 1994a; Katonda, 1994). As a result the enumeration was often incomplete and CAS catch and effort data were underestimated for 1993 (Coenen, 1994a). The 1994 and 1995 CAS data have not yet been analyzed.

1.4 Definition of fishing effort

A suitable measure of fishing effort is related to fishing mortality or rather 'fishing power' and can sometimes be shown to be linearly related to the catch rate (Sparre and Venema, 1992). In Lake Tanganyika, many different gears and therefore, units of fishing effort are used. The number of fishing nights per boat applies to liftnets, purse seines and southern beach seines (Coenen, 1994c, 1994d). For other gears, units of effort have not been defined.

Historical data from annual, statistics reports by the Fisheries Department of Tanzania do not contain the specific information necessary to estimate fishing effort for most of the gears. For example there is no information on the number of fishing nights per gear, the hauls per night or the lights per haul. The available estimates of fishing power are the total numbers of fishing vessels and fishermen. However the type of vessel is not specified except for industrial units. It is therefore unclear how many vessels employ each type of gear. The number of fishermen varies for each gear used and may not be linearly related to the fishing power.

1.5 Objectives

The aims of the present study are to present the results of the FS carried out in March 1995 for the Tanzanian part of the lake and to compare these results with historical data from past surveys.

2. ORGANIZATION

The frame survey was carried out in March 1995 as planned during the first Fisheries Statistical Coordinators Meeting for Lake Tanganyika (Coenen, 1994a).

Forty five beach recorders were involved who resided at 19 recording stations along the Tanzanian coast of Lake Tanganyika. Beach recorders at each station surveyed their section of the shoreline by moving from one landing site to the next using all available means of transport; foot, bicycle, or boat. In each region, the survey was supervised by a fisheries officer from the Fisheries Division Headquarters, Dar es Salaam.

The total cost of the survey was approximately US \$ 2,000 which was provided by the Lake Tanganyika Research Project (LTR). The monies provided for travel and miscellaneous expenses. The recording form is given in the Appendix.

3. RESULTS

3.1 Frame survey results

Results are summarized in Table 1. Detailed data are presented in Tables 2 and 3.

3.1.1 The fishing fleet

In March 1995, the Tanzanian fleet consisted of 3,009 vessels in the Kigoma Region and 1,853 vessels in the Rukwa Region. The proportional composition of fishing vessels, auxiliary boats (light boats) and transport vessels was 78.1%, 20.1% and 1.9% (2,351 and 606 and 56) respectively in the Kigoma Region and 73.2%, 20.8% and 6.0% (1,356 and 385 and 112) respectively in the Rukwa Region. Six hundred and seventy five (22.4%) vessels were broken or inactive in the Kigoma Region compared to 236 (12.7%) in the Rukwa Region.

In both regions, fishing by wooden/planked canoes, catamarans, dugout canoes, trimarans and industrial units was 60.3%, 25.4%, 12.3%, 0.4% and 0.1% (2,834 and 1,194 and 577 and 19 and 4) respectively. Sixty eight vessels (1.4%) were out fishing at the time of the survey.

3.1.2 The fisheries

The <u>traditional fishery</u> employed 6,747 hand lines, 2,917 gill nets, 410 long lines and 271 scoop nets. Fishermen in the Kigoma Region used more gill nets and scoop nets than those in the Rukwa Region (1,948 and 252 in Kigoma, 969 and 19 in Rukwa). Rukwa fishermen fished more hand lines and long lines (4,802 and 372 in Rukwa, 1,945 and 38 in Kigoma).

The <u>artisanal fishery</u> employed 1,158 liftnets, 496 beach seines and 4 Apollo liftnets. The highest concentration of liftnets was in the Kigoma Region (760 in Kigoma, 398 in Rukwa). The largest number of beach seines used was in Rukwa Region (280 in Rukwa, 216 in Kigoma).

Four <u>industrial units</u> were observed of which 3 were operating near Kigoma and 1 in the Rukwa Region.

3.2 Historical data

Table 4 presents historical effort data as estimated from FS between 1967 and 1995. The number of fishing vessels includes the number of auxilliary boats. The number of fishing vessels and fishermen (Fig. 5) declined from 1988 to 1992 with the lowest number of fishing vessels recorded in 1992.

Table 5 presents historical catch data as estimated from CAS between 1950 and 1992. The total catch increased rapidly during 1983-1985, on average 107,143 MT per year, and was more than twice the total annual weight caught in 1978-1982, on average 41,418 MT per year (Fig. 6).

4. DISCUSSION AND CONCLUSIONS

4.1 The fishing fleet

From 1988 to 1992, the number of fishing vessels declined with the lowest number of vessels being recorded in 1992 (Fig. 5). Lyimo (1995; one of the organizers of the FS in 1992), considers that there was incomplete coverage in that year rather than an actual drop in the fishing effort. Two observations were made which support this. These were the high number of fishing vessels recorded during LTR's aerial FS which was carried out in October 1992 prior to the survey by the Fisheries Department and the rise in the number of fishing vessels and fishermen recorded in 1995. The Fisheries Department's FS data for 1992 were probably underestimated due to incomplete coverage of the survey area and should not be considered in the overall historical trends in fishing effort. Table 4 shows that there are three other years for which FS results are expected to be less accurate than for other years. In 1978 the Rukwa Region was not completely monitored resulting in relatively low total numbers of fishermen and fishing vessels. In 1979 the numbers of liftnets and handlines were relatively high and the number of scoop nets was relatively low. In 1986 the number of liftnets was relatively high.

Data on the numbers of fishing vessels and fishermen are available from 1967 to 1995 (Fig. 5). Between 1971 and 1983, the fishing fleet increased in size. No annual statistics reports were available for 1980-1982. From 1984 to the present the number of fishermen remained relatively constant, on average 13,760, but at a lower level than in 1983, 16,558, while the number of fishing vessels declined. The number of fishing vessels during the last seven years can be compared to those employed before 1972. A possible reason for the decline in fishing vessel numbers may be the change from a fishery mainly based on traditional fishing methods, using dugouts and canoes, to one predominantly based on artisanal fishing, utilizing catamarans. This is a change from one boat to two boats forming a unit or 'vessel'. Artisanal liftnets were introduced in 1957 in Burundi (Katonda and Kalangali, 1994). Fifteen years later, 1972, the first liftnets were introduced to Kigoma by Burundian fishermen (Katonda and Kalangali, 1994). After 1972, the use of liftnets spread more rapidly. Liftnets are currently commonly used in Tanzania's most southern district, Sumbawanga. It may have taken 10 to 15 years for the liftnet fishery in Tanzania to cause a significant decline in the number of fishing vessels as two boats were combined to make one unit (a catamaran). At present, the number of catamarans fishing with liftnets in the Tanzanian fishing fleet represents 25.4% of the lake total.

The total annual catch increased rapidly during 1983-1985, on average 107,143 MT per year, and was more than twice the value of annual catches in the period 1978-1982, on average 41,418 MT per year (Fig. 6). This was caused by the expanding artisanal and traditional fisheries. The contribution of the total industrial catch during these years was negligible, <0.5% of the total catch (Table 2). A rapid increase in the use of artisanal liftnets, more efficient than scoop nets and gill nets, resulted in higher catches.

4.2 The traditional fishery

A decline was observed in the use of traditional fishery gears from 1973-1974 to 1995 (Table 4). In particular the employment of traditional scoop nets and gill nets was reduced to 5% and 7% respectively of the maximum numbers recorded (1973 to 1984). The traditional fishery declined as the liftnet fishery increased. Less significant decreases were seen in numbers of 26% fishermen using hand lines and long lines, 23% and respectively of the maximum numbers recorded over 22 years of records. These gears are used at the same time as liftnets during the night.

4.3 The artisanal fishery

The employment of artisanal liftnets has increased to almost three times the number recorded in 1977 (Table 4). There were no data available before that year. During the present FS, 4 Apollo units were observed. Apollo units are big catamarans which operate a larger than normal liftnet. Each canoe may be 7 to 9 m long and the surface area of the Apollo liftnet is generally more than twice the size of a normal liftnet. It is often accompanied by an auxilliary light boat and the total number of lamps employed is usually thrice as large. The Apollo unit is currently the most effective fishing unit in the northern part of the lake although it was introduced only in 1990 (Coenen, 1994b).

4.4 The industrial fishery

In recent years, 1990-1994, there has been no record of industrial catches. This has lead to the erroneous assumption that the industrial units were not operating in Tanzanian waters of Lake Tanganyika (Lyimo, 1995). However, the contribution of the industrial catch to the total annual catch is probably very low. From 1972 to 1990, the annual industrial catches have been <2% of the total annual catches. This is low in comparison to the other riparian states where industrial catches may contribute as much as 65% of the total catch (Coenen, 1994d).

4.5 Recommendations

(1) A different CAS system to the one introduced in 1992 should be used. The reintroduction of the system used previously may be appropriate (Coenen, 1994a; Katonda, 1994).

(2) To provide a suitable measurement of fishing effort, the annual statistics collected and reported by the Fisheries Department should be more specific on the type of fishing vessel employed (dugout canoe, canoe, catamaran, Apollo catamaran) and on the number of fishing nights per type of gear.

(3) Data collection on annual catches from industrial fishing companies operating purse seiners in Lake Tanganyika should recommence as was done from 1973 to 1989. The capacity of the industrial fishery in the Tanzanian part of Lake Tanganyika is unclear.

(4) An adequate budget is required for Tanzania to carry out monthly catch assessment and annual frame surveys. The two Tanzanian regions bordering Lake Tanganyika should each be provided with a boat equipped with an outboard engine so that communication and proper supervision of data collection can be maintained.

The latter recommendation was made during the first Workshop on the Coordination and Standardization of Fisheries Statistics for Lake Tanganyika, 26-30 July 1993, Bujumbura, Burundi (Coenen, 1993), and during the first Fisheries Statistical Coordinators Meeting for Lake Tanganyika (Coenen, 1994a). During the latter meeting, it was requested that LTR should continue to provide technical support, financing of frame surveys and contributions to the improvement of the fisheries statistics for Lake Tanganyika.

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Fig. 1: Major lakes of East Africa. (From: Katonda and Kalangali, 1994)



Fig. 2: Lake Tanganyika showing the Kigoma and Rukwa Region boundaries and the main landing sites. ----: international boundaries ----: regional boundaries (From: Katonda and Kalangali, 1994)



Fig. 3: Some of the fishing methods on the lake: lusenga or scoop net, chiromilla or artisanal seine, liftnet and purse seine. (From: Coulter, 1991)



Fig. 4: Kigoma and Rukwa region boundaries, major towns and access routes to Lake Tanganyika. - - - - : international boundaries -.-.- : regional boundaries ====== : roads +++++++ : railway lines (From: Katonda and Kalangali, 1994)

Table 1: Summary of the results of the simultaneous frame survey for the Tanzanian part of Lake Tanganyika, March 1995.

INFORMATION ON VESSELS AND MOTORIZATION

					TYPE OF VESS	EL					USE		-	ST	ATE	MOTOF	ZATION
REGION	No. of QUGOUT	No. of WOODEN	No. of METAL	No. of F.GLAS	No. of S CATAMARANS	No. of TRIMARANS	No. OUT	No. DUT	No. of INDUST.	No. of TOTAL	No. of AUXILLIARY	No. of TOTAL	GRAND	No. of	No. of	No. of	No. of
	CANOES	CANOES	CANOES	CANOE	5		FISHING	TRANSP.	UNIT	FISHING	BOATS	TRANSP.	TOTAL	ACTIVE	BROKEN	INB.	OUTB.
KIGOMA	550	1589	о	0	778	16	21	6	3	2351	606	56	3009	2334	675	3	351
RUKWA	27	1245	1	1	416	3	47	16	1	1356	385	112	1853	1617	236	4	136
GRAND TOTAL	577	2834	1	1	1194	19	68	22	4	3707	991	168	4862	3951	911	7	487

INFORMATION ON FISHERMEN, NUMBER AND TYPE OF FISHING GEARS

					INDUSTRIAL FISHERIES ARTISANAL FISHERIES						RADITION	IAL FISH	ERIES		
					No. of	No, of	No. of	No. of	No. of	No. of	No. of	No. of	No. of	No. of	No. of
	No. of	No. of	No, of	No. of	PURSE	BEACH	CHIROMILA	LIFTNETS	APOLLO	SCOOP	GILL	LONG	HAND	TRAPS	OTHER
REGION	STATIONS	LANDING SITES	F/MEN	LAMPS	SEINES	SEINES	SEINES		LIFTNETS	NETS	NETS	LINES	LINES		GEAR
KIGOMA	11	103	7644	6073	3	216	0	760	2	252	1948	38	1945	0	0
RUKWA	6	105	4866	1562	1	280	0	398	2	19	969	372	4802	0	0
GRAND TOTAL	17	208	12510	7635	4	496	0	1158	4	271	2917	410	6747	0	0

Table 2: Results of the simultaneous frame survey for the Tanzanian part of Lake Tanganyika, March 1995. Number of fishermen, vessels and motorization per location along the coast from north (Kigoma Region) to south (Rukwa Region).

KIGOM	A REGION -	INFORMAT	ION O	NF	ISHE	RME	<u>v, v</u>	ESS	SEL	S A	NE	<u>ом с</u>	TORIZ	ΖΑΤΙ	ON		-	Гab	le 2
DISTRICT	NOILETS LOCATION	LANDING SITE	No. of FISHERMEN	No. of DUG OUT CANOES	No. of WOODEN CANOES	A No. of METAL CANOES No. of FIBER GLASS CAN.	No. of CATAMARANS	Mo. of TRIMARANS	No. of VES. OUT FOR FISH.	No. of TRANSP. OUT	No. of INDUSTRIAL UNITS	TOT. No. of FISH, VESSELS	C M No. of AUXILLIARY BOATS	No. of THANSPORTERS	GRAND TOTAL	Mo. of ACTIVE VESSELS	H No. of BROKEN VESSELS	C No. of INBOARDS	
KIGOMA	KAGUNGA	Mkwale Mwibore Ngonya Rugonzi Misemere Mibombo Zashe Rusolo Mtambara Makombe Kahono Nyamirambo Kigunga Sub total	76 42 12 36 2 36 24 72 27 104 76 68 58 633	9 4 0 5 4 1 0 3 12 13 11 11 73	13 4 0 9 4 19 15 0 4 17 14 12 14 125	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	4 2 0 0 0 0 14 4 6 0 4 0 38		1 0 0 0 6 1 0 2 0 1	2 0 0 0 0 0 0 0 0 0 0 0 0 0 5	000000000000000000000000000000000000000	8 5 2 3 1 16 21 15 5 12 5 9 3 105	19 7 0 11 7 4 0 6 24 22 20 22 142	2 0 0 0 0 0 0 2 0 0 0 0 0 0 0 0 0 0 0 0	29 12 2 14 8 20 21 17 11 38 27 29 25 253	25 10 2 11 7 16 18 16 8 34 25 23 21 216	4 2 0 3 1 4 3 1 3 4 2 6 4 37	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	3 3 1 0 0 0 5 1 5 0 20 20
KIGOMA	MWAMGONGO	Nyamkara Nyaburembo Kiziba Miinzi Katandara Bugamba Mwamgongo Rutanga Linda Mgazimmoja Mkenke Busambo Kahama Nyansanga Karande Kaviru Kitwe Sub total	65 46 93 13 139 129 240 52 96 89 26 94 16 54 192 62 76 1487	4 3 5 0 12 8 9 3 3 1 1 3 1 4 7 1 14 79	21 17 21 7 40 38 75 15 32 6 17 59 18 19 455	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	1 4 1 0 7 0 0 0 0 0 0 0 0 1 1 0 16	0 0 1 0 0 2 4 0 0 0 0 0 0 0 0 0 0 7	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0			16 21 16 8 25 48 47 3 5 6 2 6 1 3 14 5 3 259	10 0 15 0 27 0 48 15 0 25 7 29 6 18 53 53 15 30 298	0 2 0 2 4 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	26 21 33 8 52 50 95 18 35 7 21 67 20 33 551	24 21 33 8 50 46 82 18 35 29 8 30 5 21 63 18 29 520	2 0 0 2 4 13 0 2 1 5 2 0 4 2 4		1 2 3 1 0 4 7 0 0 0 0 0 0 0 0 0 1 0 0
KIGOMA	MTANGA KIBIRIZI	Kazinga Ngerwe Mlanga Kananiye Kigalye Kagongo Kalalangabo Sub total Luanza Kibiirii	128 20 154 40 120 189 120 771 232 137	13 0 4 2 4 13 24 47 1 3	42 8 56 12 17 58 28 221 3	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	8 1 4 12 7 1 34 35 22		0 0 6 0 0 0 0 6 0 0 0 6	0 0 0 0 0 0 0 0 0 0 0	000000000000000000000000000000000000000	20 5 41 9 24 37 13 149 43 36	230 30 4 29 6 9 41 40 159 0	2 3 3 0 0 0 8 0 0	52 12 73 15 33 78 53 316 43 36	320 44 8 51 12 25 61 45 246 39 25	8 4 22 3 8 17 8 70 4	00000000000000000000000000000000000000	13 3 0 2 1 10 7 1 24 33 32
KIGOMA	KATONGA UJIJI	Sub total Kalonga Kikamba Rutale U. Forodhani Kagera Sub total	369 320 15 11 98 8 132	4 0 6 4 5 2 18	13 35 9 5 13 3 30	0 0 0 0 0 0 0 0 0 0 0 0 0 0	57 80 0 8 0 8 0 8	1 0 0 0 0 0 0 0	1 0 0 2 0 2	0 0 0 1 0 1	3 0 0 0 0 0 0 0 0	79 115 15 9 29 5 58	0 0 0 0 0 0 0	000404	79 115 15 9 33 5 62	74 84 10 8 27 4 49	5 31 5 1 6 1 13	3000000	55 80 0 8 0 8 0 8

KIGOMA REGION - INFORMATION ON FISHERMEN, VESSELS AND MOTORIZATION

KIGOMA RI	EGION - II	NFORMATIC	ON O	N FIS	HER	MEN,	VE:	5SE	ELS	AN	DI	мото	DRIZ	ATIO	N		٦	abi	e 2
DISTRICT	NOLLE LOCATION	LANDING SITE	No. of FISHERMEN	No. of DUG OUT CANOES	No. of WOODEN CANDES	Ho. of METAL CANOES Ono. of FIBER GLASS CAN.	K No. of CATAMARANS	S No. of TRIMARANS	No. of VES. OUT FOR FISH.	No. of TRANSP. OUT	No. of INDUSTRIAL UNITS	TOT. No. of FISH. VESSELS	S No. of AUXILLIARY BOATS	No. of TRANSPORTERS	GRAND TOTAL	S No. Of ACTIVE VESSELS	H No. of BROKEN VESSELS	E No. of INBOARDS	
	KASEKE	Kasaba	10	7	0	0 0	1	Q	0	0	0	8	0	0	8	6	2	۵	0
KIGOMA		Kimbwela	256	4	11	0 0	56	1	0	0	0	72	0	3	75	62	13	0	33
		Kachakaia Sub total	281	3 14	18	00	57	3	0	Ð	0	93	ő	3	96	78	18	l o	33
M	VAKIZEGA	Muyobozi	421	51	103	0 0	70	1	0	0	0	225	0	3	228	136	92	a	28
		Kampande	18	2	11	00	1	0	0	0	0	14	0	0	14	8	6	0	0
		Kimba	68	16	27	0 0	1	0	0	0	0	44	0	2	46	32	14	0	1
KIGOMA		Rugongoni	26	3	10 or	00	0	0	0	0		13	0	2	14	10	4		0
		Rugunga	62	12	35 11	0 0	2 0	0	1	0	ö	24	0	2	26	19	20 7	0	0
		Sub total	704	125	197	0 0	74	1	1	ő	ō	398	ŏ	10	408	260	148	o	29
	SUNUKA	Karago	53	2	9	DD	5	0	0	0	0	16	0	0	16	13	3	0	2
		Mviga	49	0	15	00	3	0	0	0	2	18	D	0	18	14	4		1
		Rangabeach	82 77	1	2	00	16	2	0	0	6	20 20	0	Ď	20	20	ò	ŏ	6
		Kalemela	36	Ó	ō	οõ	9	ō	õ	õ	ō	9	õ	ō	9	9	ō	Ō	ő
		Matundikani	12	0	4	0 0	1	0	0	0	0	5	0	0	5	2	3	0	0
KIGOMA		Sunuka	16	0	3	00	4	0	0	0	0	7	0	0	7	4	3	0	0
		Kinyaba Kirando	65 26	4	12	00	12	0	U A	0		23	ň	0	23	12	3	0	5 0
		Lubengela	68	ŏ	ō	ŏŏ	16	õ	õ	ŏ	ō	16	ŏ	ō	16	16	ō	ō	1
		Msihezi	34	0	5	0 0	8	0	0	0	D	13	0	0	13	8	5	0	1
		Nyansimbi	78	0	8	0 0	16	0	0	0	0	22	2	0	24	19	5	0	1
		Mkuyu	64	0	8	00	16	0	U N	0	n	24	5	0 N	24 9	9	Ô		0
		Sub total	687	14	88	00	122	š	ŏ	ŏ	ō	220	7	ŏ	227	181	46	Ŏ	22
KAPAR	AMSENGA	Ngurwe	34	0	6	0 0	7	0	0	0	0	13	0	0	13	10	3	0	0
		Busekwe	48	0	17	0 0	8	0	0	0	0	25	0	0	25	16	9	0	0
		Kaiyanta	24	1	2	00	12	0	0	U O	n	9 16	0	0	16	12	4	0	Ď
		Katara	46	ŏ	4	00	11	õ	ŏ	õ	ō	15	ŏ	1	16	12	4	ŏ	õ
		Sigoma	82	0	4	0 0	19	0	0	0	0	23	0	4	27	23	4	0	5
		Kahama	32	0	4	0 0	8	0	0	0	0	12	0	0	12	8	4	0	1
		Mgangasima	12	0	8	00	3	0	0	0	0	11	0	0	11	3	8		0
KIGOMA		Kabo	55	9	6	00	14	0	0	0 n	0	21	0 0	0	21	13	8	0	1
		Herembe	124	13	24	ŏŏ	19	ŏ	ŏ	õ	ŏ	56	ō	1	57	26	31	0	7
		Nsansa	46	2	30	0 0	3	0	0	0	0	35	0	0	35	17	18	0	2
		Kashe	70	15	36	0 0	11	0	0	0	0	62	0	0	62	24	38	0	0
		Busungura	40	5	31	00	4 0	0	0 0	U N	0	40	U n	2	40	10	24 5	0	0
		Niga	128	2	9	0 0	26	õ	õ	õ	ő	37	õ	ō	37	28	9	0	7
		Lusange	32	0	7	0 0	6	0	0	Û	0	13	0	0	13	9	4	0	0
		Kempu	62	5	5	0 0	11	0	0	0	0	21	0	0	21	16	5 K		4
		Kambeli Kabwigaya	30	0	23	00	2	ů ů	0	0	0	25	ő	ŏ	25	15	10	ŏ	ō
		Sub total	1032	49	242	ů ů	188	Ō	0	Ō	Ō	479	ō	8	487	289	198	0	29
	SIBWESA	Luegele	16	9	2	0 0	0	0	0	0	0	11	0	0	11	9	2	0	0
		Rukoma	23	10	6 2	0 0	0	0	0	0	0	16	0	0	16	12	5 4	0	1
		Kaskia	62	4	10	00	11	õ	ŏ	ŏ	ŏ	25	õ	1	26	23	3	0	3
		Ndere	24	6	8	0 0	D	0	0	0	0	14	0	1	15	13	2	0	0
		Igalula	18	7	3	0 0	0	0	0	0	0	10	0	0	10	8	2	10	0
		Mgambo	111	1	6	0 0	24	0	0	0	0	31	0	0	31	27	4		4
Kigoma		Buhingu	/8	110	3	00	10	U A	0	0	0	16	0 0	u a	16	14	2	0	0
		Kalumbi	49	10	2	00	د 9	0	0	õ	0	21	õ	Ď	21	17	4	0	õ
		Kalolwa	35	7	2	0 0	7	Ď	ō	Ó	D	15	0	Ó	16	12	4	0	0
		Storo	34	6	3	0 0	4	0	0	0	0	13	0	0	13	11	2	0	0
		Kalilani	346	23	76	0 0	0	D	0	0	0	99	0	1	100	90	10	0	11 e
					~~	~ ~	-	~					1.	6					Ģ
		Sibwesa	257	8	32	00	4	0	0 0	0	n	23	ň	4	27	23	4	0	5
		Sibwesa Kalya Kashadulu	257 73 26	8 6 8	32 4 2	000000	4 13 5	0 0 0	0 0 0	0 0 0	0	23 15	0	4	27 15	23 11	4	0	5 0
		Sibwesa Kalya Kashagulu Sub total	257 73 26 1228	8 6 8 127	32 4 2 165	00 00 00	4 13 5 104	0 0 0 0	0 0 0 0	0 0 0	0 0 0 0	23 15 396	0 0 0	4 0 9	27 15 405	23 11 337	4 4 68	0000	5 0 32

RUKWAF	REGION -	INFORMATIC	<u>IO NC</u>	V FIS	HER	MEN,	. VES	SSE	LS	AN	DN	NOTC	DRIZA		N			Гab	le 2
DISTRICT	NOLLEY	LANDING SITE	No. of FISHERMEN	No. of DUG OUT CANOES	No. of WOODEN CANOES	A No. of METAL CANOES O No. of FIBER GLASS CAN.	A No. of CATAMARANS	S No. of TRIMARANS	No. of VES. OUT FOR FISH.	No. of TRANSP. OUT	No. of INDUSTRIAL UNITS	TOT, No. of FISH, VESSELS	C S No. of AUXILLIARY BOATS	No. of TRANSPORTERS	GRAND TOTAL	Mo. of ACTIVE VESSELS	Mo. of BROKEN VESSELS	Z No. of INBOARDS	Ho. of OUTBOARDS
1	KAREMA	Lwega	19	3	D	0 0	0	0	0	2	0	3	0	2	5	5	0	0	0
		Kangwena Kamataluma	23 3	3 2	3 0	00	0	0	1	0 0	0 0	7 2	0 0	0 0	7 2	3 1	4 1	0	0 0
		Mkangasi	19		4	0 0	0	0	2	0	0	6	1	0	7	5	2	0	0
		Kakese	2	0	1	00	0	0	0	0	0	1	0	0	1	1	0	0	0
MOANDA		Karema	208	0	87	0 1	21	2	Ů	0	0	107	4	1	112	111	1	0	4
MPANUA		Kasilamunyanga	00	4	2	00	9	0	0	0	, N	13	3	U .	16	15	1	0	2
		Tupopdogolo	31	4	5	00	1	ň	0	0		2	2		10	0	3		
		Kasangalongwe	63	0	13	0 0	10	ñ	ä	0		25	1	ñ	26	26	6		2
		Shukula	20	1 i	4	0 0	1	ŏ	ŏ	ň	ŏ	6	ò	1	7	5	2		1
		Isengule	43	2	19	0 0	Ō	ō	õ	ō	0	18	3	ò	21	19	2	l o	ò
		ikola	149	1	78	0 0	13	Ō	2	Ō	ō	93	1	5	99	93	6	0	7
		Sumbwa	137	0	4	0 0	30	0	0	0	0	34	0	1	35	34	1	0	4
		Kamazile	30	0	4	0 0	6	0	0	0	0	7	3	0	10	8	2	0	0
		Kaswende	7	1	0	0 0	0	0	0	0	0	1	0	0	1	1	0	0	0
		K. Kikumbwa	10	1	1	0 0	0	0	2	0	0	3	1	0	4	3	1	0	0
		Station total	838	25	231	01	91	2	10	2	0	340	20	11	371	343	28	0	21
	KAMBWE	Kapilola Kalilo	49		10	00	10	0	0	0	, v	14	2	0	16	15	1		U
		Kansombo	102		33	00	3	0	3 2	0		20	11	2	45	20	2		4
		Kambwe	113	l õ	23	00	8	ň	3	ž	- ŏ	25	۰. ۵	5	30	36	3	0	5
		Myuna	39	ŏ	12	0 0	1	ŏ	õ	õ	ŏ	2	11	ŏ	13	13	õ	l n	1
NKANSI		M. Kerenge	136	ŏ	9	0 0	25	ō	ŏ	2	ŏ	30	4	3	37	36	ĩ	õ	11
		Kirando	64	Ó	10	0 0	3	0	1	2	1	14	1	11	26	21	5	1	6
		Katete	67	0	21	0 0	1	Ð	2	0	0	11	13	0	24	23	1	0	0
		Chongo	52	0	17	0 0	0	0	1	0	0	14	4	0	18	16	2	0	0
		isaba	44	0	21	0 0	0	0	0	0	0	18	3	0	21	21	0	0	0
		Kazovu	105	0	27	0 0	0	0	2	0	0	19	10	0	29	28	1	0	0
]		Bumanda	93	0	21	0 0	0	0	0	0	0	12	9	0	21	20	1	0	0
		Korongwe	119	0	19	0 0	11	0	0	0	0	22	8	1	31	28	3	0	4
		Utinta	141	0	14	0 0	20	0	2	3	0	81	5	7	43	42	1	0	15
		L. Msalaba	152	0	15	0 0	20	0	1	3	0	30	6	4	40	40	0	0	8
		Kachui	75	0	15	00	5 100	0	4	0	2	18	105	2	27	23	4		2
	KIDA	Station Iolal	1413	0	280	1 0	- 109	<u> </u>	21	12	⊹	312	16	12	452	422	30	<u> </u>	- 20
	KIPIL	Nkanga	8	ñ	5	0 0	ĥ	ñ	ñ	0			1	0	5	3	2	0	0
		Uwile	63	l o	22	0 0	ŏ	õ	ő	ō	ő	9	13	ó	22	19	3	0	õ
		Mkinga	71	Ó	30	0 0	1	0	0	0	o	13	18	0	31	24	7	0	Ó
		Isitwa	4	0	Ð	0 0	1	0	0	0	0	1	0	0	1	1	0	0	0
		Unwe/Ngoza	15	0	5	0 0	0	0	0	0	0	1	4	0	5	5	0	0	0
		Lwala	22	0	7	0 0	1	Ô	0	0	° I	5	3	0	8	8	0	0.	0
		File	62		29	0 0	4	0	1	0	2 V	11	23	U C	34	~	6		0
		Kaurisha	15		20	0 0	1	0	U O	0	~	-	4	0 n	20	12	7		0
NICANICI		Fyela	44	0	19	0 0	1	n	n	ñ	ň	5	9	ñ	14	13	í		n
14070431		Mbolula	<u> </u>	n n	3	0 0	'n	n	õ	ň	ň	3	ñ	ő	3	0	3	10	õ
1		Msangamwise	20	0.	5	0 0	ñ	Ď	õ	õ	ŏ	2	3	õ	5	5	ŏ	lõ	õ
		Ngalwa	4	l õ	2	0 0	ŏ	ō	Ō	õ	ō	2	Ō	ō	2	2	ō	0	ō
		Kolwe	11	ō	3	0 0	ō	ō	0	ō	0	1	2	Ō	3	3	Ó	0	0
1		Kisambala	38	Ó	13	0 0	Ō	0	9	0	0	18	4	0	22	22	0	0	0
1		Twiu	18	Ó	5	0 0	0	0	0	0	0	4	1	0	5	5	0	0	0
		Miosi	7	0	2	0 0	0	0	٥	0	0	1	1	0	2	2	0	0	0
		Namansi	95	0	26	0 0	0	0	0	2	0	13	13	2	28	25	3	0	0
1		Chele	26	0	7	00	4	0	0	0	0	10	1	0	11	6	5	0	0
1		Usichela	14	0	2	0 0	1	0	0	0	0	2	1	0	3	3	0	0	0
1		Kapamba	31	0	10	0 0	0	0	0	0	0	5	5	0	10	8	2	0	0
		Station total	653	0	240	10	10	0	10	2	0	132	135	15	282	236	46	3	6

RUKWA REGION - IN	FORMATIC	<u>NON</u>	FIS	HERN	IEN.	VES	SE	LS	AN	DN	IOTO	RIZA	TION	1			<u>Fab</u>	le 2
DISTRICT DISTRICT DISTRICT DISTRICT	LANDING SITE	No. of FISHERMEN	No. of DUG OUT CANDES	No. of WOODEN CANOES	D No. of METAL CANOES O No. of FIBER GLASS CAN.	TI K No. of CATAMAPANS	0 00 No. of TRIMARANS	No. of VES. OUT FOR FISH.	No. of TRANSP. OUT	No. of INDUSTRIAL UNITS	TOT. No. of FISH. VESSELS	C M No. of AUXILLIARY BOATS	No. of TRANSPORTERS	GRAND TOTAL	S No. of ACTIVE VESSELS	H No. of BROKEN VESSELS	Z No. of INBOARDS	- No. of OUTBOARDS
KIZUMBI	Kasishe	9	0	2	0 0	0	0	0	0	0	1	1	0	2	2	0	0	0
NKANSI	Mkilinga Lyapinda Lupata Msamba Kapindi Kasulu Nachaunji	18 18 28 64 11 15 12	0. 0 0 0 0 0	10 7 12 19 2 2 4		4 1 0 1 0 0	0 0 0 0 0 0	0 0 0 0 0 0		000000000000000000000000000000000000000	12 7 8 12 2 1 3	2 1 4 7 1 1	003000000000000000000000000000000000000	14 8 12 22 3 2 4	6 8 15 3 2 4	8 2 4 7 0 0 0	0 0 0 0 0 0 0	
	Kasanga	20	0	11	0 0	0	0	0	0	0	6	5	0	11	9	2	0	0
	Mweni Kasali	10 27	0	3 4	0 0	2	U N	U N	0	0	4	1	0.0	5 6	3	2		U D
	Chutwe	8	õ	4	00	ō	Ō	ŏ	õ	ŏ	3	ĩ	õ	4	2	2	o	õ
	Kilambo	18	0	8	0 0	0	0	0.	0	0	5	3	0	8	8	0	0	0
	Lyeia Katuti	35 16	0	2	00	ó	0	0	0	0	8 8	1	0	9	8	0	0	0
	ltanga	40	ŏ	18	0 0	3	Ō	Ō	ō	ō	6	15	2	23	22	1	Ō	2
	Mwinza	77	0	20	0 0	9	1	0	0	0	28	2	5	35	27	8	0	2
	izinga Lusambwa	23	0	1	00	24	0	0	0	0	25	0	4	29 16	28	1		3
	Katale	50	ō	18	0 0	8	ŏ	ŏ	õ	ō	26	ŏ	4	30	25	5	o	2
	Kizumbi	10	0	6	0 0	0	0	0	0	0	6	0	0	6	4	2	0	0
	Nganga	6	0	6	0 0	0	0	0	0	0	6	0	0	6 27	6	0	0	0
	Kikonko Kalende	89 54	0	17	00	20 6	0	0	0	D	20	1	0	21	18	3	0	0
	Station total	769	Ō	213	0 0	88	1	Ō	Õ	Ō	253	49	19	321	259	62	0	9
KALA	Tundu	43	0	15	0 0	5	0	0	0	0	20	0	1	21	18	3	0	4
	Kala	59 24	0	12	00	4	0	0	0	0	10 6	6 0	2	18 6	18	0		2
	Miamba	16	ō	ŏ	00	4	õ	õ	õ	ŏ	Ă	õ	ŏ	4	4	õ	0	õ
NKANSI	Kipela	8	0	0	0 0	2	0	0	0	0	2	0	0	2	2	0	0	0
	Alis	20	0	0	0 0	5	0	0	0	0	5	0	0	5	5	0	0	0
	Kizingo	35 79	0	10	00	3 0	0	0	0 0	0	10	3 15	0	23	22	4	0	0
	Kapumpuli	68	ŏ	17	0 0	13	Ō	ō	ō	ō	17	13	5	35	34	1	Ō	5
	Mpasa	136	0	12	0 0	29	0	0	0	0	41	0	2	43	34	9	0	5
	Katanti	16	0	4	0 0	1	0	0	0	0	3	2	0	2	2	U N		0
	Station total	512	ŏ	93	0 0	74	ŏ	ŏ	ŏ	ŏ	128	39	10	177	159	18	0	16
SAMAZI	Kapele	32	1	8	0 0	0	0	0	0	0	9	0	4	13	7	6	0	0
	Kasisi	39	0	13	00	2	0	0	0	0	13	U 6	5	13	12	4	0	5
	Katvoko	7	ō	4	0 0	D	ō	ō	ŏ	ō	4	ō	Ō	4	3	1	0	ō
	Songambele	21	0	6	0 0	6	0	0	0	0	7	5	0	12	8	4	0	1
	Kilewani	102	0	33	0 0	2	0	0	0	0	34	1	0	35	25	10	0	07
SUMBAWANGA	Muzi	48 01		14 0	00	Ų 1⊿	U n	0 n	0	0 n	23	8 0	4	27	23	4	ő	5
	Katili	71	1	18	0 0	ō	õ	0	õ	ō	15	4	ō	19	16	3	0	0
	Kalepa	25	0 0	10	0 0	Ó	0	0	0	0	6	4	0	10	7	3	0	0
	Kisala	79	0	26	0 0	9	0	0	0	0	35	0	0	35	30	5	0	5
	Samazi	67		14	00	5	0	U n	0	0	14	5	1	15	12	3		0
{	Kazomba Molwo	18	0	15	0 0	0	0	0	0	0	7	1	õ	8	6	2	0	õ
	Station total	681	2	188	0 0	38	Ő	0	Ő	Ő	191	37	22	250	198	52	0	28
REGIONAL TOTAL	105	4866	27	1245	11	416	3	47	16	1	1356	385	112	1853	1617	236	4	136

Table 3: Results of the simultaneous frame survey for the Tanzanian part of Lake Tanganyika, March 1995. Number and type of fishing gears per location along the coast from north (Kigoma Region) to south (Rukwa Region).

KIGOMA	REGION - NUM	ABER AND TY	PE OF	FISHING GE	ARS								Ta	ble 3
DISTRICT	N N N N N N N N N N N N N N N N N N N	LANDING SITE	No. of LAMPS	No. of PURSE SEINES	No. of BEACH SEINES	No. of CHIR. SEINES	No. of LIFTNETS	No. of AP. LIFTNETS	No. of GILL NETS	No. of SCOOP NETS	No. of LONG LINES	No. of HAND LINES	No. of TRAPS	No. of OTHER GEAR
	LOCATION	h dha ya la		IND. FISH.	~	ATISAN	AL FISH	<u>٦.</u>		THAD	TIUNA	L FISH.		
KIGOMA	KAGUNGA	Mkwale Mwibore Ngonya Rugonzi Misemere Mibombo Zashe Rusolo Mlambara Makombe Kahono Nyamirambo	68 37 13 0 13 12 0 79 30 31 69 52		3 1 3 1 0 0 1 5 5 3		4 2 0 0 13 3 5 0 0		000000000000000000000000000000000000000		8 0 0 0 0 0 0 0 0 0 0 0	0 0 0 31 31 0 0 0 0		0 0 0 0 0 0 0 0 0 0
		Kigunga	37	C	3	0	0	0	0	0	0	0	0	ō
	MWAMGONGO	Sub total Nyamkara Nyaburembo	441 30 6	0 0 0	26 2 0	0 0 0	31 0 1	0	0	0	0	62 226 40	0	0
		Kiziba Mlinzi KalandaLa Bugamba Mwamgongo	26 6 0 60 156	0 0 0 0	3 0 6 5 9	0 0 0 0	4 1 0 2 11	0 0 0 0	0 0 0 0	0 0 0 0	0 0 0 0	0 11 35 34 61	0 0 0 0	0 0 0 0
KIGOMA		Rutanga Linda Mgazimmoja Mkenke Busambo Kahama	27 61 53 13 75 12	0 0 0 0 0	3 5 6 2 6 1	0 0 0 0 0	0 0 0 0 0	0 0 0 0	0 0 0 0 0	0 0 0 0 0	0 0 0 0 0	0 0 0 0		000000000000000000000000000000000000000
		Nyansanga Karande Kaviru Kitwe Sub total	36 133 38 39 771	0 0 0 0	3 11 4 3 69	0 0 0 0	0 1 1 0 21	0 0 0 0	000000000000000000000000000000000000000	0 0 0 0	0 0 0 0	0 0 0 407	0 0 0 0	0 0 0 0
KIGOMA	MTANGA	Kazinga Ngerwe Mtanga Kananiye Kigalve	102 12 94 28 88	0 0 0 0	6 1 10 2 2	0 0 0 0	8 1 3 1 12	0 0 1 0 0	0 0 0 20	0 0 0 0	0 0 0 6 0	6 0 0 0	0 0 0 0	0 0 0 0
	2 1010-1 2 1	Kagongo Kalalangabo Sub total	146 94 564	0	7 4 32	0 0 0	7 1 33 36	0 0 1 0	0 0 20	0 0 0	0 0 6	0 6 0	0 0 0	0 0 0
	KIBIRIZI	Kibirizi Sub total	160 358	3 0 3	0	0	0 36	0	0	6 6	0 0	36 36 155	0	0
	KATONGA UJUI	Kalonga Kikamba Rulale	0 0	0	0	0	0	0	88 53	0	2	0	0	0
KIGOMA		U. Forodhani Kagera Sub total	24 0 24	0 0 0 ·	6 0 6	0 0 0	8 0 8	0 0 0	173 63 377	0 0 0	0 0 2	0 23	0	0 0

KIGOM	A REGION - NUM	MBER AND TY	PE OF	FISHING GE	ARS				,				Ta	ble 3
RICT	NOF	DING SITE	of LAMPS	ol PURSE SEINES	of BEACH SEINES	of CHIR. SEINES	of LIFTNETS	of AP. LIFTNETS	of GILL NETS	of SCOOP NETS	of LONG LINES	of HAND LINES	ol TRAPS	of OTHER GEAR
LS I	IA	NA.	6	ő	ō	ė	ē	0	ė	ö	6	ō	ö	ő
<u> </u>	N LOCATION	2	z		z	Z		z	Z .	Z	Z	Ż	Ż	Z
<u> </u>	LUCATION	Kasaba		IND. HSH.		RIISAL	VAL FISH			THADI	10NA	L HSH.	_	
KIGOMA	NAGERE	Kimbwela	347	0	ŏ	ŏ	44	1	20	3	9	ŏ	ŏ	ő
		Kachakala	4	0	1	Ō	0	0	40	3	1	ō	ō	ō
		Sub total	357	0	1	0	45	1	130	6	12	0	0	0
	MWAKIZEGA	Muyobozi	566	. 0	0	0	69	0	40	63	0	532	0	0
		Kampande	8	0	0	0	1	0	106	1	0	0	0	0
RICOMA		Kimba	82	U		0	1	0		29	U A	0	0	0
KIGOMA		Kabeba	121	0	0	ő	2	0	58	44	18	30	0	0
		Rugunda	0	õ	4	õ	ō	ŏ	75	0	õ	õ	ŏ	ŏ
		Sub total	793	0	7	0	73	Ō	279	144	18	562	0	ō
	SUNUKA	Karago	27	Q	1	0	5	0	71	0	0	15	0	0
		Mviga	15	0	0	0	3	0	32	0	0	44	0	0
		Kite Basesharah	95	0		0	17	D	10	4	0	46	0	D
		Kalemala	34	U 0		U A	1/	0	0	2	U O	34 19	0	
		Matundikani	3	0	1	0	1	ñ	n n	ñ	n	3	ñ	
KIGOMA		Sunuka	16	õ	o i	Õ	4	õ	Ō	ŏ	õ	8	ŏ	ŏ
		Kinyaba	84	0	0	0	13	0	29	0	0	27	0	0
		Kirando	0	0	1	0	0	0	28	0	Q	32	0	0
		Lubengela	67	0	0	0	16	0	0	0	0	32	0	0
		Msinezi Myansimhi	- 34 - 68	0		0	8 16	n	0	ň	0	32	ů n	0 0
		Mkuvu	64	ő	l o	õ	16	õ	ŏ	ŏ	õ	32	ŏ	ŏ
		Nvasibamba	15	o	1	ō	D	ō	10	ō	ō	2	ō	ō
		Sub total	620	0	5	0	125	0	185	6	0	359	0	0
	KAPARAMSENGA	Ngurwe	34	0	0	0	7	0	0	3	0	10	0	0
		Busekwe	48	0	0	0	8	0	0	8	0	1	0	0
		Kalyanta	18	0	0	0	5	0	0	0	0	4	0	0
		Kangwena Katara	48	0		0	12	0	40	ő	0	24	ů i	
		Sigoma	76	õ	1	õ	19	õ	0	ŏ	õ	33	ŏ	ŏ
		Kahama	32	0	0	0	8	0	0	0	0	14	0	0
		Mgangasima	12	0	0	0	з	0	0	0	0	6	0	0
KIGOMA		Kabo	56	0	0	0	14	0	0	0	0	22	0	0
		Mgondozi	62	0	0	0	12	0	0	1	0	24	0	0
		Herembe	114	U		U O	19	0		14	0	48	0	
		Kashe	40 68	ő	Ö	õ	11	ő	40	12	ő	ŏ	ŏ	ŏ
		Busungura	35	ō	Ō	ō	4	ō	0	11	ō	2	õ	0
		Kaparamsenga	12	0	0	0	O	0	45	4	0	1	0	0
		higi	126	0	0	0	26	0	0	6	0	20	0	0
		Lusange	35	0	U	U D	ь 11	n		35	0	1	0	
		Kambeli	33	0	ŏ	ŏ	6	ŏ	43	š	õ	ŏ	ŏ	ŏ
		Kabwigaye	8	0	2	0	2	0	40	0	Ó	12	0	0
		Sub total	970	0	3	0	188	0	208	77	0	244	0	0
	SIBWESA	Luegele	0	0	0	0	0	0	72	0	0	4	0	0
		Rukoma	0 26	0	2	0	U G	0	40	0	0	2	0	
		Kanyase	- 30 56	0		n n	11	ñ	14	6	õ	6	õ	ŏ
		Ndere	õ	0	1 1	ŏ	0	ŏ	41	5	õ	2	ō	ō
1		Igalula	Ō	0	1	0	C	0	29	2	0	1	0	0
1		Mgambo	96	0	2	0	24	0	10	0	0	1	0	0
KIGOMA		Buhingu	66	0	1	0	16	0	68	0	0	15	0	0
		Nkonkwa	8	0	2	0	2	0	99	0	0	2	0	
		Kalumbi	36	U O		0	9 7	0	23	U n	U n	3 A	0	
		Sioro	16	0 N	2	0	4	0	10	0	Ď	2	õ	ŏ
		Kalilani	164	õ	31	õ	16	ō	56	ō	õ	4	0	0
		Sibwesa	16	0	23	0	4	0	66	0	0	8	0	0
1		Kalya	53	0	2	0	13	0	68	0	0	23	0	
		Kashagulu	20	0	67	U A	120	n n	749	13	0 0	91 91	ă	o o
DEGICILI	TOTAL	SUD totai	6072	2	216	0	760	2	1948	252	38	1945	Ő	D
THEGIONA	AL IUTAL	100	0070	z					•					

RUKWA REGION - NUM	BER AND TYP	PEOF	FISHING GE	ARS								Tat	ole 3
NOLUCATION	LANDING SITE	No. of LAMPS	No. of PURSE SEINES	No. of BEACH SEINES	SEINES Seines	A No. of LIFTNETS	No. of AP. LIFTNETS	No. of GILL NETS	No. of SCOOP NETS	S No. of LONG LINES	H No. of HAND LINES	No. of TRAPS	No. of OTHER GEAR
KIZUMBI	Kasishe	0	0	1	0	0	0	0	0	0	1	0	0
NKANSI	Mkilinga Lyapinda Lupata Msamba Kapindi Kasulu Nachaunii	16 2 0 3 0	0 0 0 0 0	0 1 7 1 2		4 1 0 1 0		0 0 0 0	0 0 0 0 0 0	0 0 0 0 0	0 6 0 0 0	000000	0 0 0 0
	Kasaban	-	õ		õ	š	š	10	Š	Š	3	0	
	Kasanga Mweni Kasali Chutwe Kilambo	5 10 4 0 4	0 0 0 0	0 2 1 1	0 0 0 0	0 2 0 0	0	18 0 0 0 16	0 0 0 0	0 0 0 0	1 0 1 1	000000	0 0 0 0
	Lyela	14	0	1	0	7	0	0	0	0	0	0	0
	Kafuti Itanga Mwinza	0 6 20	0 0 0	0 2 3	0 0 0	0 3 10	0 0 0	0 0 23	0 0 0	0 0 0	16 0 0	0 0	0
	Izinga	28	Ô	3	0	14	ñ	0	ň	Ő	ñ	n	ň
	Lusembwa.	2	0	ō	ō	1	õ	46	õ	õ	õ	ō	ŏ
	Katale	8	0	1	ō	8	ō	30	ō	ō	6	ō	ŏ
	Kizumbi	ō	0	2	Ō	ō	ō	5	ò	õ	ō	ō	ō
	Nganga	0	0	0	0	0	0	14	0	0	0	Ó	0
	Kikonko	38	0	0	0	17	0	30	0	0	0	0	0
	Katenge	14	0	1	0	6	0	47	0	0	0	0	0
	Station total	174	0	31	0	76	0	229	0	0	35	0	0
KALA	Tundu	10	0	0	0	5	0	0	0	0	23	0	0
	Kala	4	0	6	0	1	0	0	0	0	0	0	0
	Lolesha	12	0	0	0	6	0	0	0	0	0	Q	0
	Miamba	8	0	0	0	4	0	0	0	0	0	0	0
NKANSI	Kipela	4	· 0	0	0	2	0	0	0	0	0	0	0
	Alis	10	0	0	0	5	0	0	0	0	0	0	0
	Kizingo	12	0	3	0	3	0	0	0	0	0	0	0
	Kilambo	14	0	14	0	0	0	0	0	0	0	0	0
•	Kapumpuli	58 F0	0		0	13	U	0	Ű	0	0	0	0
	Mpasa	58	U		0	29	0	10	0	0	0	0	
	Katanu		0		ő	2	o o	0	0	0	0	0	0
	Station total	197	ñ	27	ñ	71	õ	10	ñ	ñ	23	ñ	ň
SAMAZI	Kapele	0	0	3	0	0	0	0	0	4	4	0	0
	Kasisi	0	0	0	0	0	0	119	0	0	8	0	0
	Kipwa	8	0	4	0	2	0	0	0	0	0	0	0
	Kalyoko	0	0	0	0	0	0	34	0	0	0	0	0
	Songambele	6	. 0	1	0	3	0	0	0	0	0	0	0
	Kilewani	8	0	7	0	2	0	36	0	0	17	0	0
SUMBAWANGA	Muzi	8	0	4	0	1	0	5	0	0	0	0	0
	Lusambo	48	0	3	0	14	0	0	0	0	8	0	0
	Katili	0	0	7	0	0	0	29	0	0	6	0	0
1	Kalepa	9	0	2	Q	0	0	18	0	0	7	0	0
1	Kisala	31	0	1	0	9	0	13	0	0	31	0	0
1	Samazi	19	0	5	C	5	0	0	0	0	7	0	0
1	Kazomba	D	0	3	0	0	0	24	0	0	13	0	0
	Molwe	0	0	1	٥	0	0	15	0	0	3	0	0
	Station total	137	0	41	0	36	0	293	0	4	104	<u></u>	0
REGIONAL TOTAL	105	1562	1	280	0	398	2	969	19	372	4802	<u> </u>	U

RUKWA REGION - NUM	BER AND TYP	PEOF	FISHING GE	ARS								Tat	ole 3
NOLUCATION	LANDING SITE	No. of LAMPS	No. of PURSE SEINES	No. of BEACH SEINES	SEINES Seines	A No. of LIFTNETS	No. of AP. LIFTNETS	No. of GILL NETS	No. of SCOOP NETS	S No. of LONG LINES	H No. of HAND LINES	No. of TRAPS	No. of OTHER GEAR
KIZUMBI	Kasishe	0	0	1	0	0	0	0	0	0	1	0	0
NKANSI	Mkilinga Lyapinda Lupata Msamba Kapindi Kasulu Nachaunii	16 2 0 3 0	0 0 0 0 0	0 1 7 1 2		4 1 0 1 0		0 0 0 0	0 0 0 0 0 0	0 0 0 0 0	0 6 0 0 0	000000	0 0 0 0
	Kasaban	-	õ		õ	š	š	10	Š	Š	3	0	
	Kasanga Mweni Kasali Chutwe Kilambo	5 10 4 0 4	0 0 0 0	0 2 1 1	0 0 0 0	0 2 0 0	0	18 0 0 0 16	0 0 0 0	0 0 0 0	1 0 1 1	000000	0 0 0 0
	Lyela	14	0	1	0	7	0	0	0	0	0	0	0
	Kafuti Itanga Mwinza	0 6 20	0 0 0	0 2 3	0 0 0	0 3 10	0 0 0	0 0 23	0 0 0	0 0 0	16 0 0	0 0	0
	Izinga	28	Ô	3	0	14	ñ	0	ň	Ő	ñ	n	ň
	Lusembwa.	2	0	ō	ō	1	õ	46	õ	õ	õ	ō	ŏ
	Katale	8	0	1	ō	8	ō	30	ō	ō	6	ō	ŏ
	Kizumbi	ō	0	2	Ō	ō	ō	5	ò	õ	ō	ō	ō
	Nganga	0	0	0	0	0	0	14	0	0	0	Ó	0
	Kikonko	38	0	0	0	17	0	30	0	0	0	0	0
	Katenge	14	0	1	0	6	0	47	0	0	0	0	0
	Station total	174	0	31	0	76	0	229	0	0	35	0	0
KALA	Tundu	10	0	0	0	5	0	0	0	0	23	0	0
	Kala	4	0	6	0	1	0	0	0	0	0	0	0
	Lolesha	12	0	0	0	6	0	0	0	0	0	Q	0
	Miamba	8	0	0	0	4	0	0	0	0	0	0	0
NKANSI	Kipela	4	· 0	0	0	2	0	0	0	0	0	0	0
	Alis	10	0	0	0	5	0	0	0	0	0	0	0
	Kizingo	12	0	3	0	3	0	0	0	0	0	0	0
	Kilambo	14	0	14	0	0	0	0	0	0	0	0	0
•	Kapumpuli	58 F0	0		0	13	U	0	Ű	0	0	0	0
	Mpasa	58	U		0	29	0	10	0	0	0	0	
	Katanu		0		ő	2	o o	0	0	0	0	0	0
	Station total	197	ñ	27	ñ	71	õ	10	ñ	ñ	23	ñ	ň
SAMAZI	Kapele	0	0	3	0	0	0	0	0	4	4	0	0
	Kasisi	0	0	0	0	0	0	119	0	0	8	0	0
	Kipwa	8	0	4	0	2	0	0	0	0	0	0	0
	Kalyoko	0	0	0	0	0	0	34	0	0	0	0	0
	Songambele	6	. 0	1	0	3	0	0	0	0	0	0	0
	Kilewani	8	0	7	0	2	0	36	0	0	17	0	0
SUMBAWANGA	Muzi	8	0	4	0	1	0	5	0	0	0	0	0
	Lusambo	48	0	3	0	14	0	0	0	0	8	0	0
	Katili	0	0	7	0	0	0	29	0	0	6	0	0
1	Kalepa	9	0	2	Q	0	0	18	0	0	7	0	0
1	Kisala	31	0	1	0	9	0	13	0	0	31	0	0
1	Samazi	19	0	5	C	5	0	0	0	0	7	0	0
1	Kazomba	D	0	3	0	0	0	24	0	0	13	0	0
	Molwe	0	0	1	٥	0	0	15	0	0	3	0	0
	Station total	137	0	41	0	36	0	293	0	4	104	<u></u>	0
REGIONAL TOTAL	105	1562	1	280	0	398	2	969	19	372	4802	<u> </u>	U

Table 4: Historical data on annual fishing effort per type of fishery for the Tanzanian part of Lake Tanganyika (1967-1995). Data were collected from frame surveys by recorders along the coast (source: Tanzanian Fisheries Department) except for 1992, when LTR conducted an aerial frame survey. The numbers of auxilliary (light) boats were included in the total numbers of fishing vessels. Data between parenthesis were considered to be less accurate than for other years. In 1978 and 1992 values were probably underestimated due to incomplete coverage of the survey area. In 1979 the numbers of liftnets and handlines were relatively high and the number of scoop nets was relatively low. In 1986 the number of liftnets was relatively high.

1					IND. FISHERIES			ARTISANAL	FISHERI	ES	T	RADITI	ONAL FI	SHER	Y
	No. of	No. of	No. of	No. of	No. of	TOTAL	No. of	No. of	No. of	No. of	. No. of	No. of	No. of	No. of	No. of
VEAD	FISHERMEN	VECCELC	INBOARD	OUTBOARD	PURSE	No. of	BEACH	CHIROMILLA	UFTNETS	APOLLO	SCOOP	GILL	HAND	LONG	TRAPS
- ICAN		VESSELS	ENGINES	ENGINES	SEINES	SEINES	SEINES	SEINES		UFTNETS	NETS	NETS	LINES	UNES	
1967	5360	3250													
1968	8633	3505				185					7054	20077			
1969	0000	3712				105					7954	20977			
1970	6102	3405													
1971	7877	3958				286					3516	5649	15157		1
1972	11781	4950			2	155					3886	4179	10107		•
1973	13448	7017	5	123	3	724	132	592			4316	20452	23570		15
1974	13150	6840	13	80	5		122				4281	41956	20010		15
1975	12350	5520			2										
1976	14238	8408			4										
1977	15426	7654			5		200		389		4973	26297			
(1978)	(8978)	(4428)			······································	cho	lera epide	mic + few data	rom Rukwa re	gion					
(1979)	13342	10432			4		413		(814)		(501)	23476	(51058)	841	
													• •		
1983	16558	11468			3										
1984	13896	7721	33	96	2		534		360		3851	44661	15996		1669
1985	13625	597 9	11	207	6		493		451		2974	16559	6919		136
(1986)	13837	4537	7	238	7		627		(1203)		2312	2892	3297		10
1987	13528	3620	20	251	6		580		540		1655	2188	16156		29
1988	16565	4301	9	301	5		562		634		2519	2131	9184		29
1989	15400	3747	3	241	3		397		612		1183	53 32	30022	1559	· · ·
1990	15799	4495	4	294	4		407		673		1267	4967	23889	1559	
1991	13651	3292	3	222	-3		259		993		1019	5480	25405		
(1992)	(8784)	(2176)	(1)	(92)	(1)		(618)		(691)		(257)	(1424)	(505)		
1992*		3169	L		r		*:a	erial trame surv	ey (LTR)						
1995	12510	4698	7	487	4	496	496	0	1158	4	271	2917	6747	410	0

	CATCH PER FISHERY					PELAGIC CATCH				
		TRADITIONAL		CATCH	INDUS.	LAT		ALL	TOTAL	TOTAL
	INDUSTRIAL	AND ARTISANAL	TOTAL	PER	% OF	STAP	CLUP	LAT	PELAGIC	OTHER
YEAR	CATCH	CATCH	CATCH	HECTARE	TOTAL	CATCH	CATCH	CATCH	CATCH	CATCH
	(MT)	(MT)	(MT)	(kg/ha)	(%)	(MT)	(MT)	(MT)	(MT)	(MT)
1950			3670	3						
1964			16163	12						
1965			15825	12						
1966			15000	11						
1967			22497	17		15	17163	2813	19976	2521
1968			30387	23		247	15272	7878	23150	7237
1969			14184	11						
1970			46452	34						
1971			50568	37			45289	1935	47224	3344
1972			49017	36			38006	3414	41420	7597
1973	589	55333	55922	41	1.1		23106	9438	32544	23378
1974	3131	73488	76619	57	4.1		51536	9209	60745	15874
1975	530	63815	64345	48	0.8					
1976	220	73336	73556	54	0.3					
1977	550	61338	61888	46	0.9		50136	3815	53951	7937
1978	635	35821	36456	27	1.7		30593	2007	32600	3856
1979	460	43714	44174	33	1.0	13	22590	7936	30526	13648
1980	470	37576	38046	28	1.2					
1981	240	43976	44216	33	0.5					
1982	220	43980	44200	33	0.5					
1983	195	99160	99355	74	0.2					
1984	107	106995	107112	79	0.1	8456	72299	13644	85943	21169
1985	244	114720	114963	85	0.2	16861	82522	22633	105155	9808
1986	320	69707	69708	52	0.5	15694	45126	17461	62587	7121
1987	183	93728	93911	70	0.2	22517	61735	24663	86398	7513
1988	74	62736	62810	47	0.1	11823	33089	15924	49013	13797
1989	20	59474	59494	44	0.0	7082	38694	10291	48985	10509
1990	1		64866	48						
1991			63503	47		11958	36518	14421	50939	12564
1992			80525	60		14170	54021	19802	73823	6702

Table 5: Historical data on annual catches per type of fishery for the Tanzanian part of Lake Tanganyika (1950-1992). Data are extrapolated from catch assessment surveys (source: Tanzanian Fisheries Department) recorded at stations along the coast.



Fig. 5: Historical annual effort data, numbers of fishermen (O) and fishing vessels (A), for the Tanzanian part of Lake Tanganyika (1967-1995).



Fig. 6: Historical annual catch data, total (O) and industrial (A) (MT), for the Tanzanian part of Lake Tanganyika (1950-1992).