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THE FISHING CENTRES OF LAKE NIASSA

(MOZAMBIQUE)

Results of a frame survey made in June 1983

by

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SUMMARY

ABSTRACT

This report presents the results of the first frame survey of the fishing centres on the mozambican coast of Lake Niassa, held in June 1983.

A total of 41 fishing centres were detected in the area and visited. Through direct enquiries in each centre an estimated number of 3 380 fishermen and 1 230 fishing boats (of which 25 motorized) were established. The enquires gave also information on the types and quantities of fishing gear used.

A first estimation of the approximate total annual catch in the area gave a figure in the order of 9 100 tons., of which about 90% is landed during the rainy season.

The survey is a part of a research programme on the fishing resources of Lake Niassa and of a project for the collection and organization of fisheries statistics from the artisanal fisheries of the mozambican side of Lake Niassa.

RESUMO

Neste relatório são apresentados os resultados obtidos no primeiro cruzeiro de reconhecimento dos centros de pesca da costa moçambicana no Lago Niassa, realizada em Junho de 1983.

Foram observados 41 centros de pesca na área, e através de inquéritos aos pescadores foi estimado o número de pescadores (3 380 aproximadamente), o número de barcos (1 230, dos quais 25 com motor) e o número e tipos de artes de pesca existentes.

A partir do mesmo inquérito, foi feita também uma primeira estimativa do volume das capturas anuais totais, que ascendem às 9 100 toneladas, noventa por cento das quais são obtidas na estação das chuvas.

O cruzeiro insere-se num programa de investigação dos recursos pesqueiros do Lago Niassa, e na organização da recolha de estatísticas de pesca artesanal do sector moçambicano do lago.

I - INTRODUCTION

Phase II of the MONAP Programme (The Nordic Countries Assistence to Development in Mozambique) includes a Coastal and Inland Waters Fisheries Development Project, which was started in 1980.

This project destined much effort in terms of fisheries research and development of the two main inland water masses of Mozambique, Lake Niassa and the man-made Cahora Bassa Dam Lake.

In Lake Niassa, research activities aimed at assessing the fisheries resources of the lake were started in 1981, beginning with exploratory and trial fishing cruises. After the Combinado Pesqueiro (*) of Metangula was established, sampling and analysis of commercial catches of that area has also been carried out.

Until now, however, there has not been possible to introduce a system that makes it possible to establish, with any precision, which is the total volume of catches from the artisanal fisheries in the mozambican part of the lake.

As a first approach to this problem, a frame survey was carried out in June 1983, in a 12-day cruise where all fishing villages and landing places of the mozambican coast were visited. The survey aimed at collecting information on the structure, size and geographical distribution of the fishing centers, and was carried out through direct contact and questionning of the fishermen in the area.

The information obtained from this survey will be used as a base for the development of a fisheries statistics network, which in the future will permit to obtain more reliable catch data.

(*) Combinado Pesqueiro: Artisanal fisheries development center. State-oriented enterprise which has the double role of introducing improved fishing techniques and giving practical assistance to the local fishermen in its area of influence.

II - OBJECTIVES

The main objectives of the survey can be summarized as follows:

1 - To determine the distribution and localization of the fishing centres (villages, landing sites)

2 - To obtain estimates of the number and status of the fishermen

3 - To obtain estimates of the number and types of fishing craft used

4 - To obtain estimates of the number and types of fishing gear used

5 - To obtain general information on the volume and composition of the catches.

III - WORKING METHODS

1. Stratification of the mozambican coast of Lake Niassa

The mozambican coastline of Lake Niassa is approximately 245 km long, and is mainly constituted by three kinds of shore structure: rocky shores, sandy shores and areas with reeds (Phragmites mauritianus). The northern part is mainly sandy, while the southern part is mostly rocky. (see map 1).

The stratification of the working area was based on the structure of the coastline, using the classification presented in Bernacsek et al. (1983), which considers eight strata or zones. The exact localization and specific characteristics of each zone are presented in Tab. 1 and 2.

1. Nhiambo zone: Extends from the tanzanian border until south of Manhai. It has 39 km of sandy coast.

2. Chigoma zone: From north of N'tumba to south of Ponta Mala, with 42 km of sandy coast.

3. M'bueca zone: From north of M'bueca to south of Limbue, with 23 km of rocky shore.

4. N'go zone: From north of N'go to south of Xuanga, it presents 32 km of sandy shore.

5. Metangula zone: From north of Seli to south of Lussefa, with 40 km of mixed shore structure (sandy/rocky).

6. Chilobelo zone: From north of Ukungo to south of Matumbwe; 44 km of rocky shore.

7. Gilambo zone: From north of Gilambo to south of Gilambo, with 17 km of rocky shore.

8. Meponda zone: From north of Meponda until the malawian border; 10 km of mixed shore struture (sand/rocky).

Table 1 - Stratification of the mozambican coast of Lake Niassa

Nº.	Zone	Coast line (km)	Structure of the coast line		
			Rocky %	Sandy %	Reefs %
1	Nhiambo	39	67	22	11
2	Chigoma	42	7	61	32
3	M'bueca	23	63	25	12
4	N'go	32	4	94	2
5	Metangula	40	48	35	17
6	Chilobelo	44	63	32	5
7	Gilambo	15	89	11	0
8	Meponda	10	28	56	16
Total		245	100	100	100

Table 2 - Localization of the stratification zones of the mozambican coast of Lake Niassa

		Localization	
		Northern boundary	Southern boundary
1	Nhiambo	11° 34' 02" S 34 57 04 E	11° 55' 02" S 34 54 02 E
2	Chigoma	11 55 02 S 34 54 02 E	12 11 40 S 34 42 10 E
3	M'bueca	12 11 40 S 34 42 10 E	12 24 00 S 34 42 00 E
4	N'go	12 24 00 S 34 42 00 E	12 38 06 S 34 47 08 E
5	Metangula	12 38 06 S 34 47 08 E	12 57 08 S 34 45 08 E
5	Chilobelo	12 57 08 S 34 45 08 E	13 18 08 S 34 47 06 E
7	Gilambo	13 18 08 S 34 47 06 E	13 23 05 S 34 51 02 E
8	Meponda	13 23 05 S 34 51 02 E	13 29 04 S 34 51 09 E

2. Collecting information

The survey was carried out with the research vessel "Kampango". Masterfisherman Alejandro Vallejos was in charge of navigation, while the authors conducted the survey proper, with the assitance of local persons with good knowledge of the area and the fishing centres. The detailed schedule of the cruise is presented in Appendix I.

The participants were split into two working teams, each constituted by one researcher and one local person. Whenever a fishing centre was detected, a team went ashore and interviewed the principal fishermen and/or the head of the village. The questionnaire is presented in Appendix II.

3. Estimating the number of fishermen

The number of fishermen was estimated through different methods, according to the situation found in each place. In some villages, the people interviewed knew exactly the number of fishermen, boats and gears that pertained to that site. In other places, the information was less accurate, and it became necessary to use different approaches in order to obtain estimated numbers.

Thus, for example, it was in some cases possible to estimate the number of fishermen out from the number of gears, knowing the average number of men that are necessary to operate the gear.

4. Estimating the catches

Through the interviews, information was obtained on the average individual daily catches, in the rainy and the dry seasons, for each of the main fishing gears utilised. Information was also collected on the fishing grounds, species composition and other data.

The total catch was estimated from these data, but it is necessary to bear in mind that the values thus obtained represent an underestimation; on one side because the catches from handlines, long-lines and traps were not considered, and on the other hand, because fishermen are traditionally reluctant to give exact information on their catches, giving normally figures below the actual values.

IV - RESULTS

1. Geographical distribution of the fishing centres

A total of 41 fishing centres were observed along the mozambican shore of Lake

Niassa. The distribution of the centres, presented in Map 2, shows that the centres are located at the mouth of rivers or on sandy beaches.

No fishing centre was observed in the Gilambo zone, probably because of its proximity to the village of Meponda, which belongs to the next zone.

Table 3 - Relative distribution of the fishing centres, by zone

Nº.	Zone	Number of Fishing Centres	Distribution %
1	Nhiambo	8	20
2	Chigoma	7	17
3	M'bueca	2	5
4	N'go	9	22
5	Metangula	9	22
6	Chilobelo	5	12
7	Gilambo	0	0
8	Meponda	1	2
Total		41	100

2. Distribution of fishermen, vessels and gear

2.1. Fishermen

The total number of fishermen was estimated at 3,383. Of these, 1,099 are proprietors of boats/gear (33%) while 2,284 are assistants (67%).

The proprietors are usually the owners of a single boat and a varying number of gear. Fishermen who owned gear only, were also considered in the proprietor group.

From this we can see that more than two thirds of the fishermen do not possess a single means to fish with.

Table 4 - Number and relative distribution of fishermen, according to their status, by zone

Nº.	Zone	Number of fishermen			Distribution (%)		
		Total	Prop.	Assist.	Total	Prop.	Assist.
1	Nhiambo	274	96	178	8,1	8,7	7,8
2	Chigoma	814	258	556	24,1	23,5	24,3
3	M'bueca	78	30	48	2,3	2,7	2,1
4	N'go	934	315	619	27,6	28,7	27,1
5	Metangula	620	172	448	18,3	15,7	19,6
6	Chilobelo	377	168	209	11,1	15,3	9,2
7	Gilambo	0	0	0	0,0	0,0	0,0
8	Meponda	286	60	226	8,5	5,5	9,9
Total		3383	1099	2284	100,0	33,0	67,0

2.2. Fishing craft

The total number of fishing craft was estimated at 1,228, of which only 25 were motorised boats. The number of boats in each centre varies from 0 to 200. The 25 motor boats are concentrated in 7 centres, mainly in the Metangula zone.

Table 5 - Number and relative distribution of fishing boats, by zone

No.	Zone	Number of boats			Distribution %
		Total	no/motor	w/motor	Total
1	Nhiambo	88	88	-	7,2
2	Chigoma	278	278	-	22,5
3	M'bueca	31	31	-	2,6
4	N'go	260	260	-	21,0
5	Metangula	180	159	21	14,7
6	Chilobelo	187	185	2	15,3
7	Gilambo	-	-	-	-
8	Meponda	204	202	2	16,7
Total		1 228	1 200	25	100,0

2.3. Fishing gear

The fishing gear which were considered in the questionnaire are:

- Nets: Chilimila net*, beach seine, gill-net;
- Lines: Hand-line and long-line;
- Traps.

In the majority of the centres gill-nets and handlines are used. The other gear were registered in the following order of numeric importance: traps, long-lines, chilimila nets and beach seines.

In 11 centres all the mentioned gear were found.

In Appendix III, the detailed distribution of fishermen, vessels and gear in each fishing centre is presented. As explained before, the figures are in most cases estimates, as the survey was carried out through enquiries and not through direct counting.

Table 6 - Estimated number of the main fishing gear used in Lake Niassa, by zones

Nº.	Zone	Chilimila nets	Beach Seines	Gill-nets	Hand lines	Long lines	Traps
1	Nhiambo	37	1	122	16	8	3
2	Chigoma	68	8	238	558	56	65
3	M'bueca	8	1	27	22	17	58
4	N'go	8	21	245	308	127	478
5	Metangula	37	10	241	129	54	16
6	Chilobelo	18	13	198	19	48	4
7	Gilambo	-	-	-		-	-
8	Meponda	11	3	66	400	30	30
Total		187	57	1137	1452	340	654

3. The catches

3.1. Estimation of total catches

Assuming that the average number of effective fishing days per month is 20,

* A local type of open-water seine

the total annual catch, estimated from the data obtained during the survey, amounts to approximately 9,100 metric tons. of which more than 90% is landed in the rainy season.

Table 7 - Estimated annual catches, by zones and season (tons)

No.	Zone	Rainy Season	Dry Season	Total
1	Nhiambo	2203	70	2273
2	Chigoma	2768	106	2874
3	M'bueca	502	20	522
4	N'go	590	55	645
5	Metangula	1690	95	1785
6	Chilobelo	730	53	783
7	Gilambo	-	-	-
8	Meponda	196	31	227
Total		8679	430	9109

3.2. Catch composition

More than 50% of the catches consist of fishes from the "utaka" group (Haplochromis spp.), which are usually caught with the chilimila net, a local type of seine.

Table 8 - Total estimated catches (tons), by main gear, for each zone during the rainy season

Nº.	Zone	Chilimila	Beach Seine	Gillnet
1	Nhiambo	2064	24	115
2	Chigoma	2259	377	131
3	M'bueca	384	96	22
4	N'go	163	364	64
5	Metangula	1313	302	75
6	Chilobelo	486	206	38
7	Gilambo	-	-	-
8	Meponda	150	34	12
Total		6819	1403	457

Table 9 - Total estimated catch (tons) by main gear, for each zone during the dry season

Nº.	Zone	Chilimila	Beach Seine	Gillnet
1	Nhiambo	59	5	6
2	Chigoma	65	24	17
3	M'bueca	12	6	2
4	N'go	19	27	9
5	Metangula	58	23	14
6	Chilobelo	37	4	12
7	Gilambo	-	-	-
8	Meponda	24	5	?
Total		274	94	62

3.3. Yields

Despite sandy bottoms presenting higher catches than fishing grounds with rocky bottoms, the latter provide higher yields, probably because of the existence of great concentrations of utakas associated with this kind of bottom.

Table 10 - Percentage of total annual catch and catch per effort unit (ton/boat) for each type of bottom

Substrate	Total Catch	% of Total catch	CPUE (Ton/Boat)
Rocky	3021	33	9,4
Sandy	4303	47	5,9
Mixed	1785	20	9,9
Total	9109	100	

There is, thus, a strong correlation between the relative abundance (CPUE) of fish stock and the kind of substrate. The conclusions reached by Jackson et al. (1963), explain this to some degree:

> "The close association of utaka with underwater rock formations, particularly when a current is flowing, is used by local fishermen

in the most efficient method of catching utaka, eg., by use of the chilimila, a form of open-water seine. This is shot upstream of an underwater rock (called Chirundu) when a current is flowing, and is swept down towards the Chirundu by the current, the paddling effort of the canoes serving only to form the net into its fishing shape. Utaka congregate near the rock, positioning themselves in the current to catch the plankton drifting with it. They are concentrated in a definite area relative to the current and when the net is tucked many are captured".

The chilimila net is by far the most important method of catching utaka and it is unlikely that it will ever be completely superseded by other methods (See Appendix IV)

The catches vary considerably, through the year. A considerable fall-of in gill-net catches during the cold months (dryseason) was also noted by Jackson et al. (1963) (See Table 8 and 9).

V - CONSIDERATIONS ON TRADING PRACTICES

Fish landings on the mozambican side of Lake Niassa is through this survey estimated to be about 9,100 tons. Looking at this figure one might be persuaded to believe that the consumers along the lake shore are being supplied with this commodity to at least satisfy their minimum needs. But this is not the truth.

The fact is that more than 50% of the fish harvested is being sold illegally by fishermen to the neighbouring countries (Malawi and Tanzania). This is due to the inability of society to absorb fishermen's capital.

Attempting to overcome this situation, with solutions in terms of creating more infrastructures (improvement of communication systems, better marketing of fishing supplies and consumer goods) should be the aim of the competent authorities, in order to assure that the resources available do not create "internal diseconomies" for the country.

VI - REFERENCES

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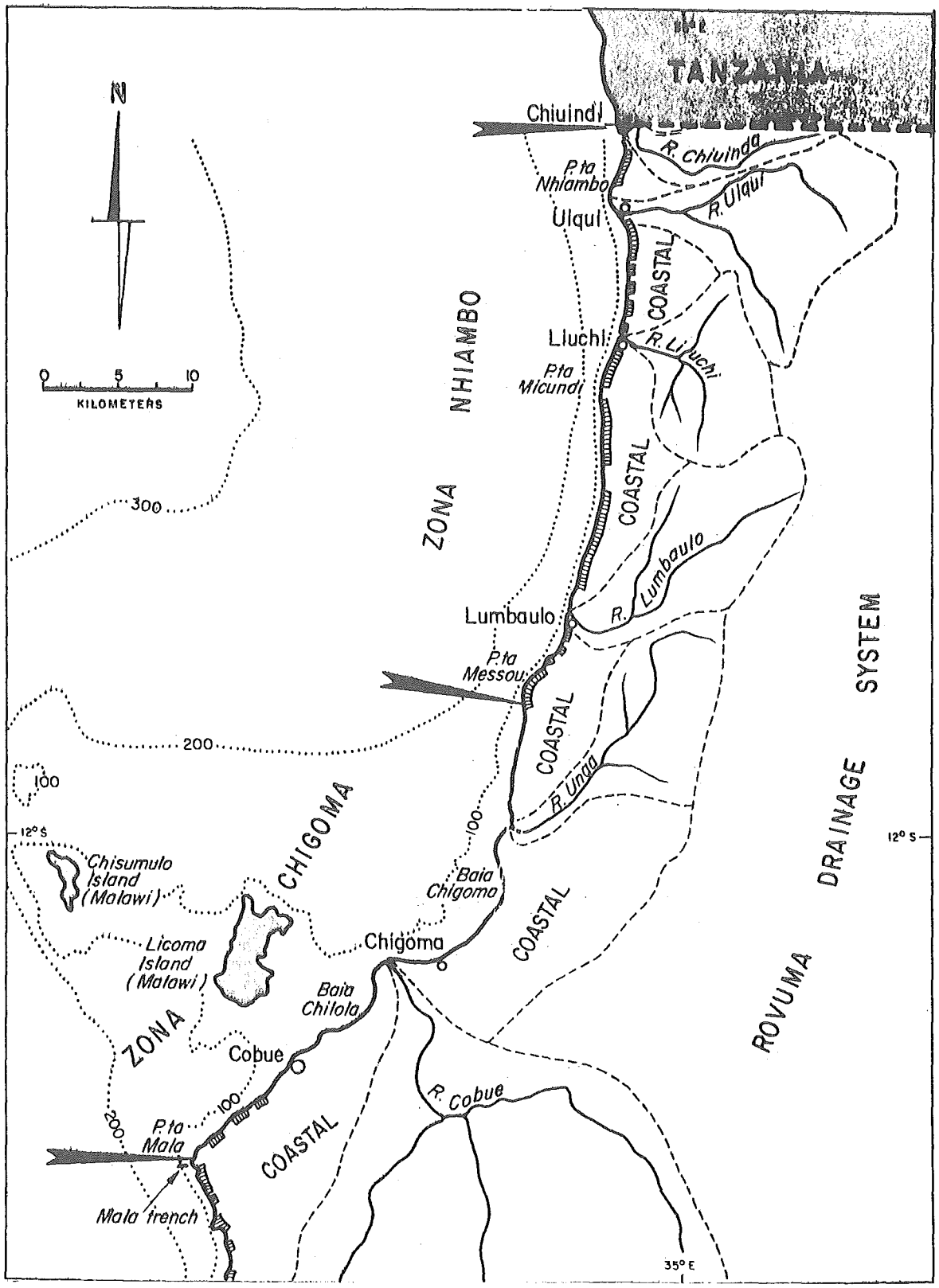

FIG. 1 a Stratification of the Mozambican coast of Lake Niassa

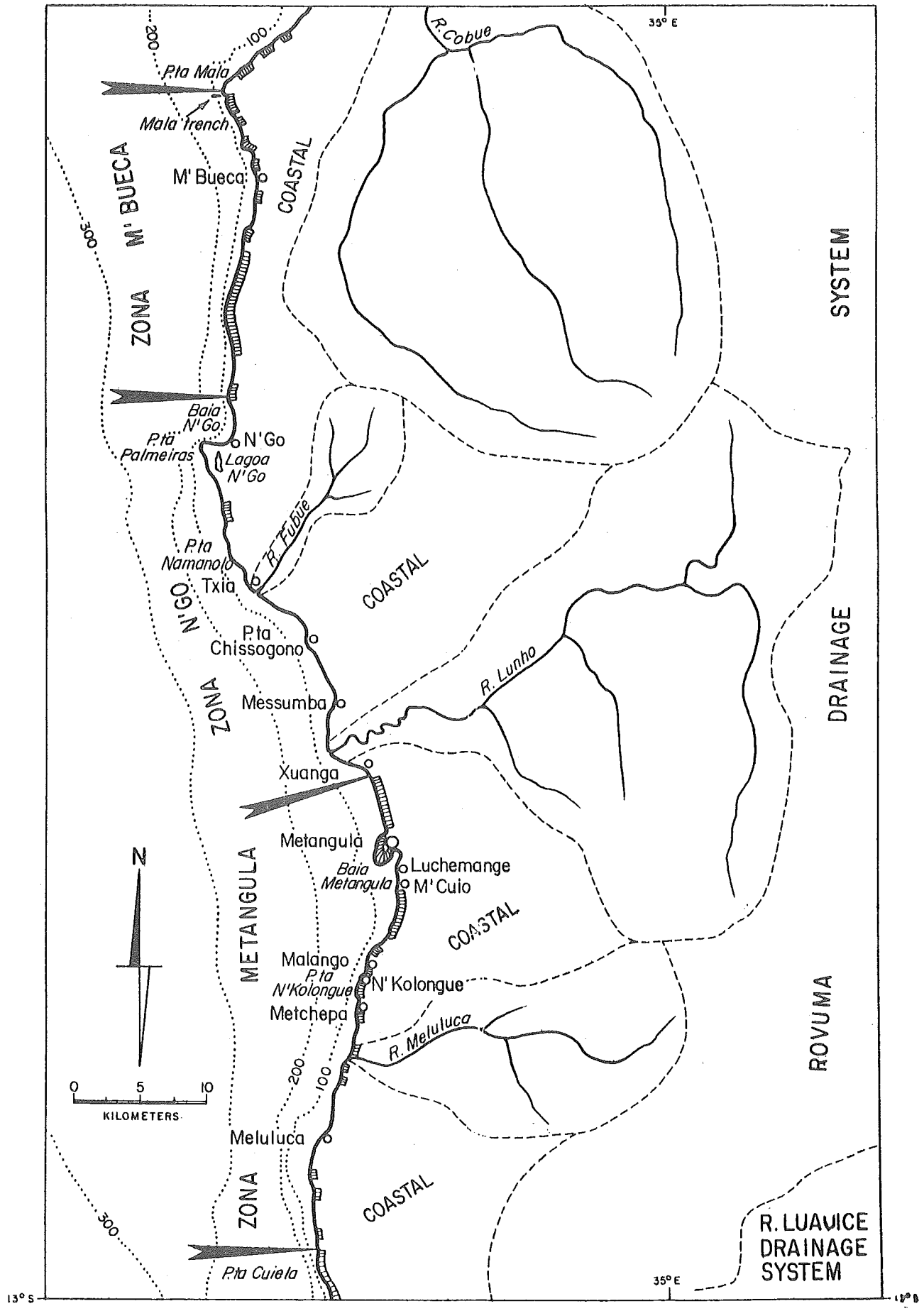

FIG. 1 b Stratification of the Mozambican coast of Lake Niassa

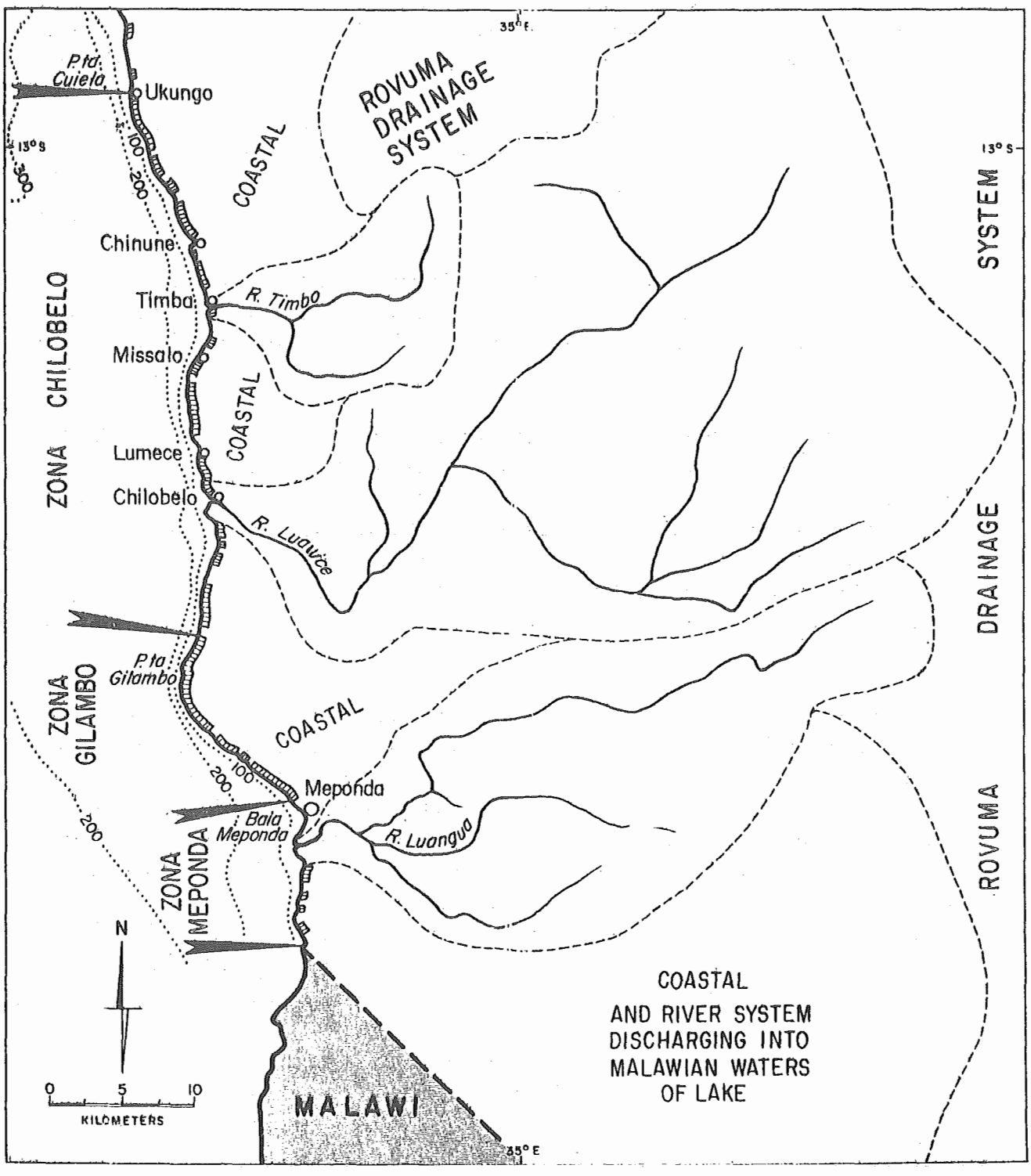

FIG. 1 c Stratification of the Mozambican coast of Lake Niassa

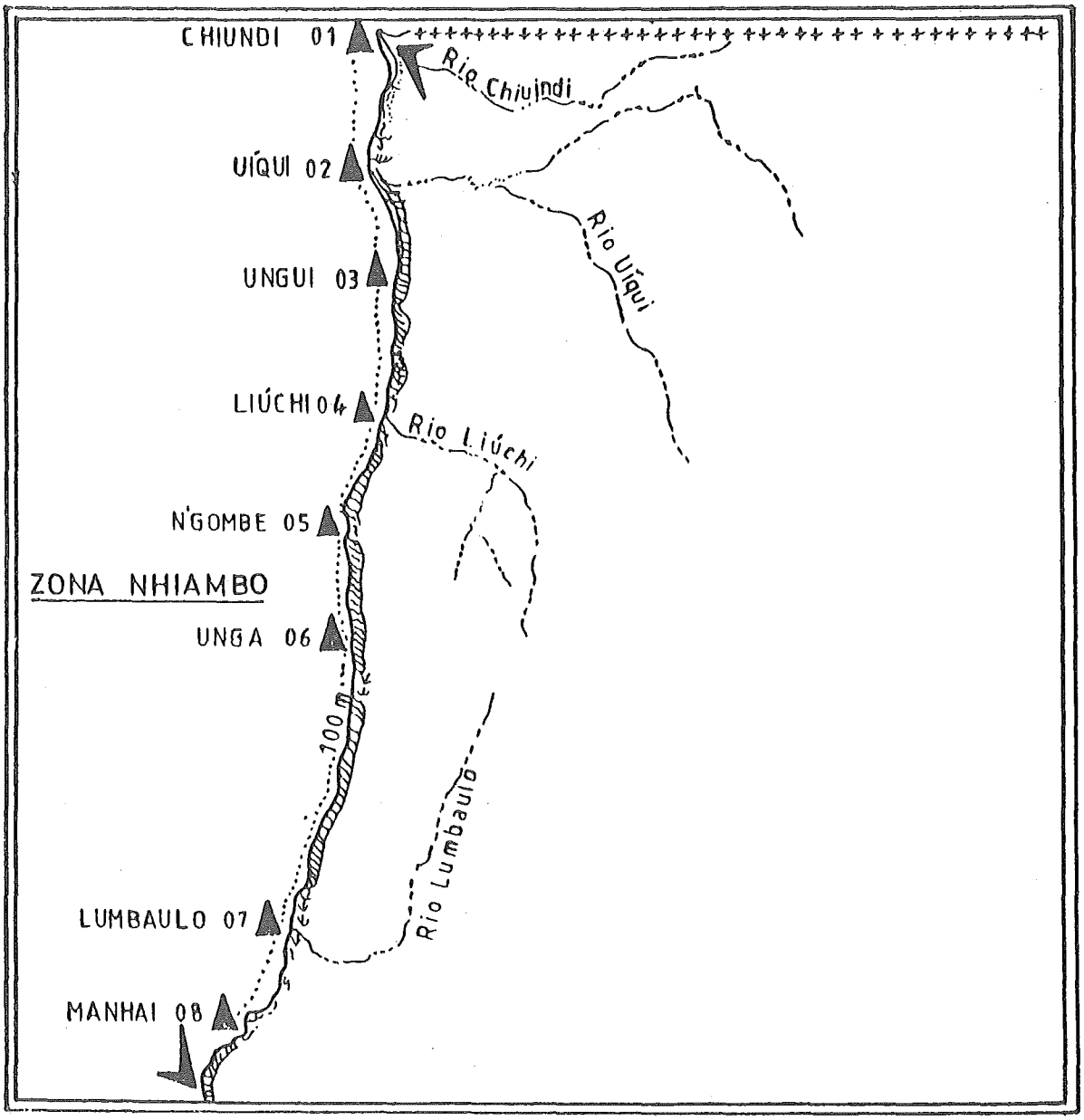

FIG. 2 a Nhiambo zone

Rocky

Sandy

Phragmites mauritianus

Fishing centre

Zone limits

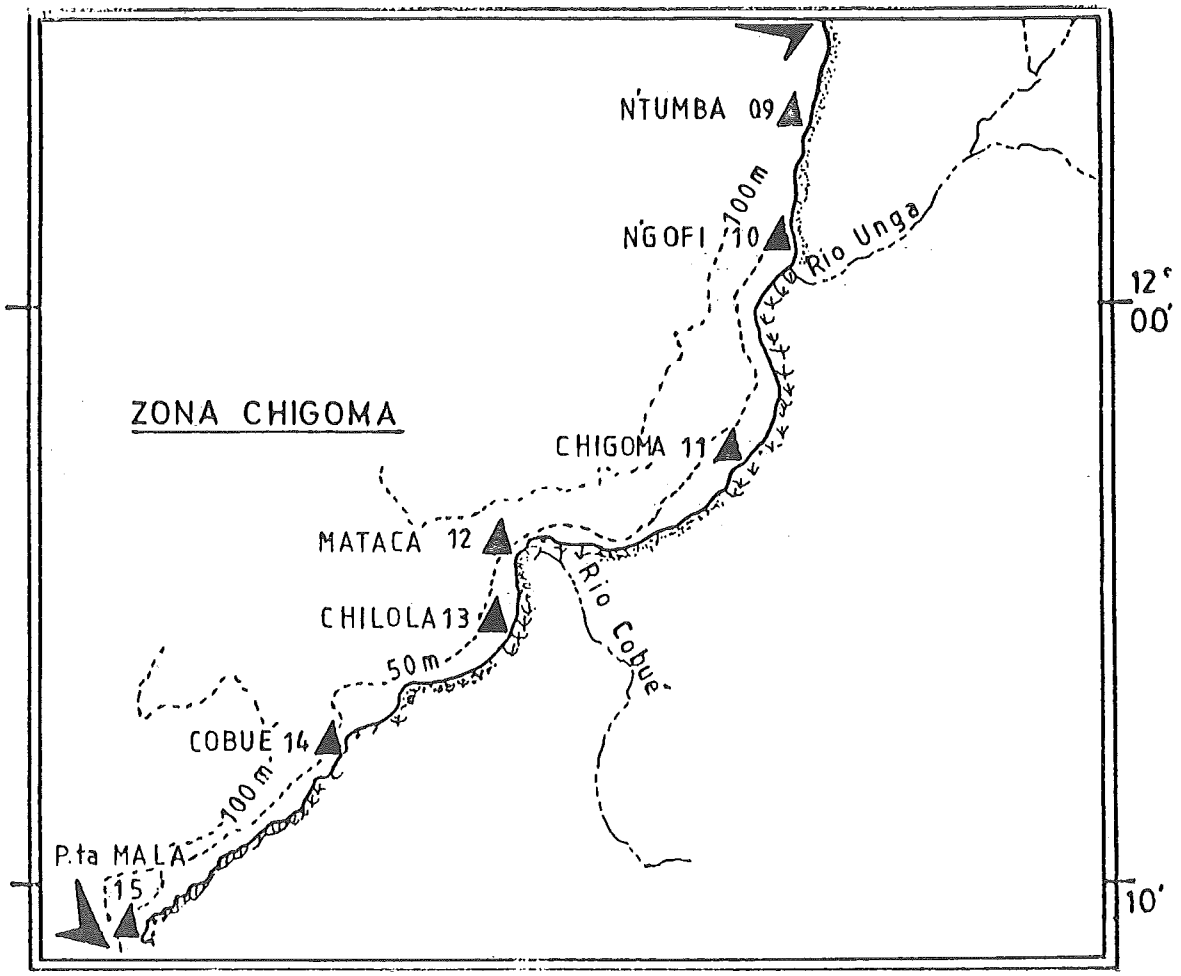

FIG. 2 b Chigoma zone

Rocky

Sandy

Phragmites mauritianus

Fishing centre

Zone limits

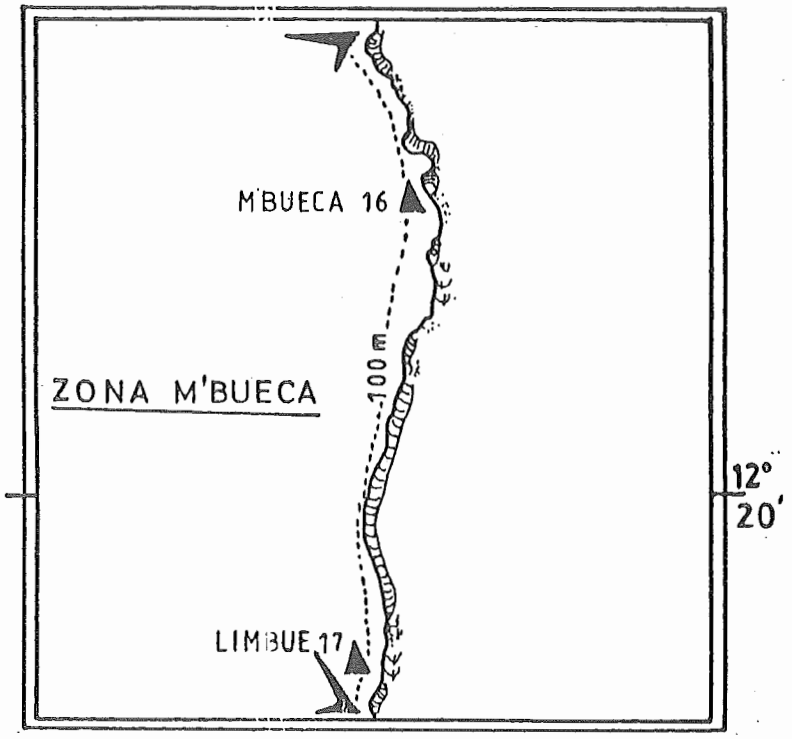

FIG. 2 c M'bueca zone

Rocky

Sandy

Phragmites mauricianus

Fishing centres

Zone limits

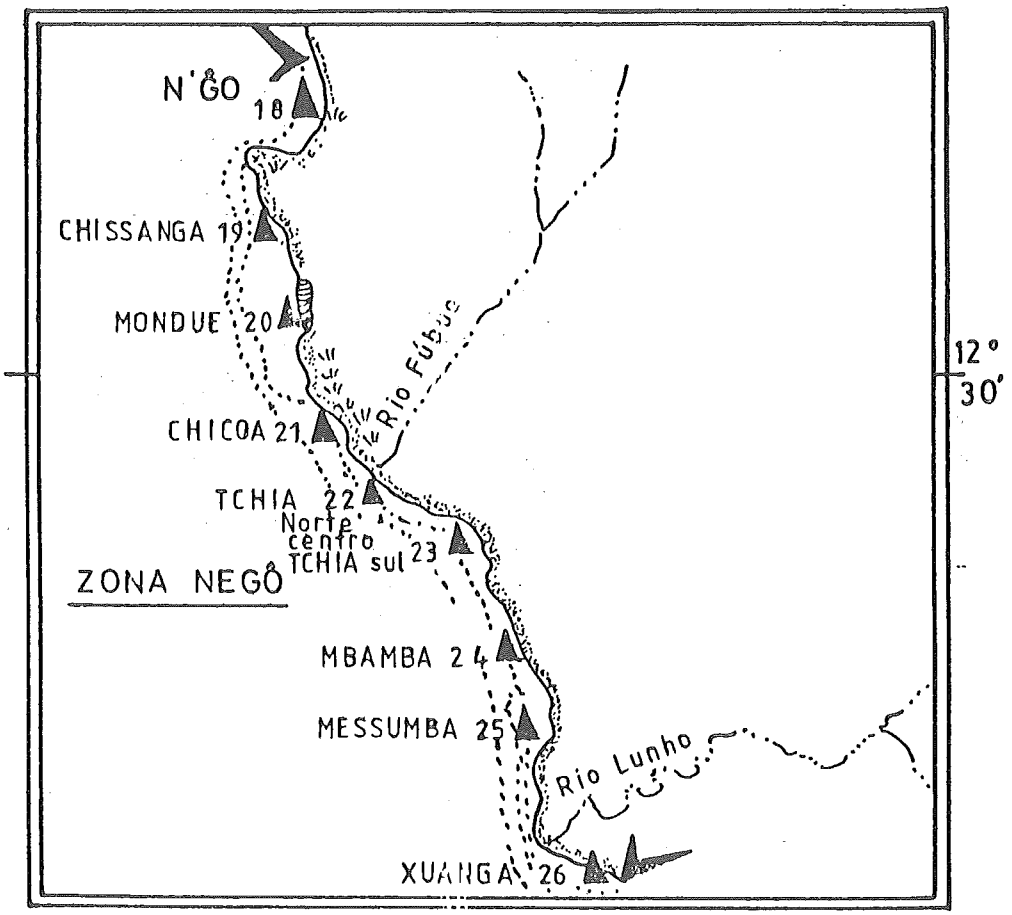

FIG. 2 d N'go zone

Rocky

Sandy

Phragmites mauritianus

Fishing centre

Zone limits

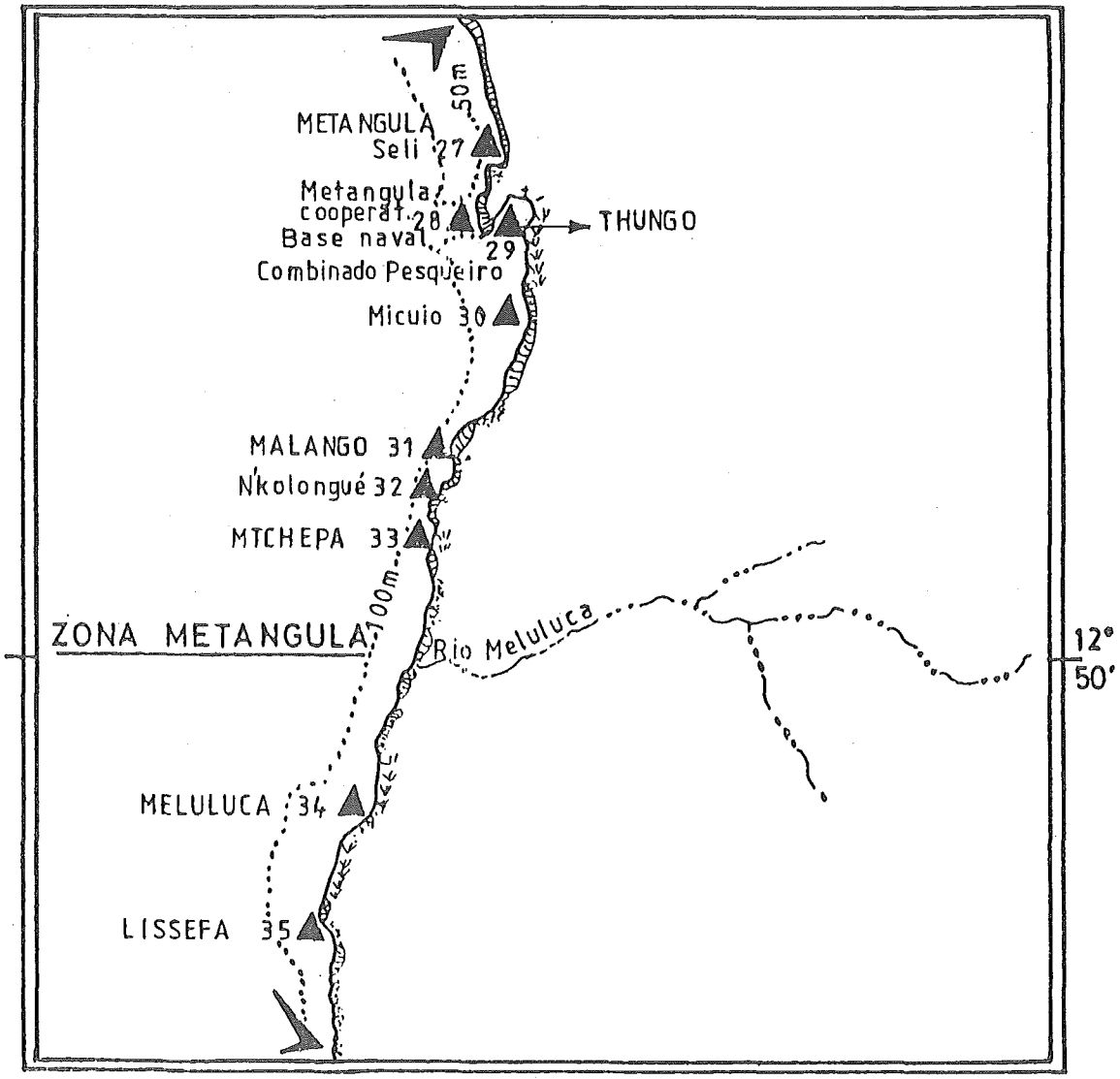

FIG. 2 e Metangula zone

Rocky

Sandy

Phragmites mauritianus

Fishing centres

Zones limits

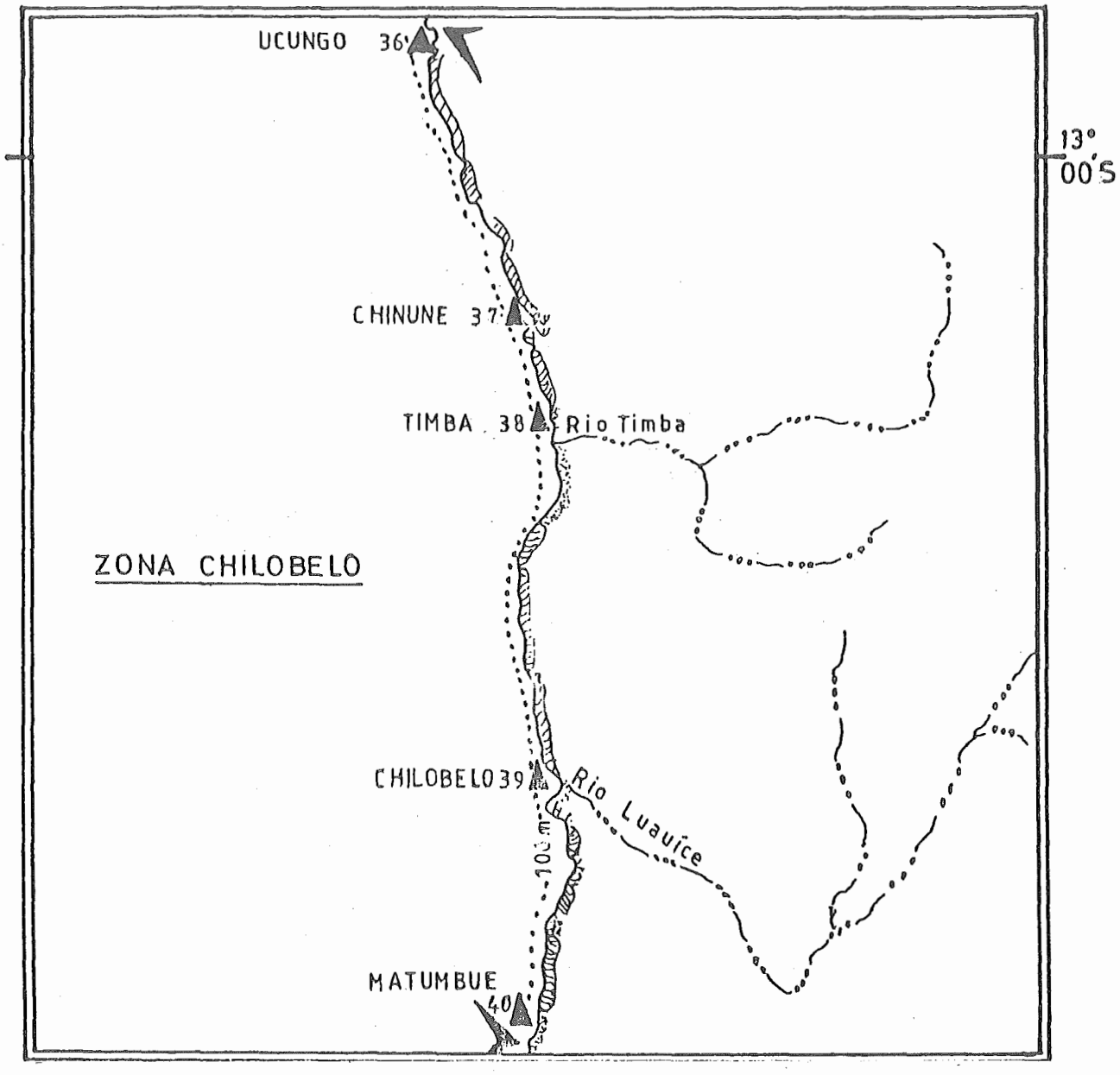

FIG. 2 f Chilobelo zone

Rocky

Sandy

Phragmites mauritianus

Fishing centres

Zone limits

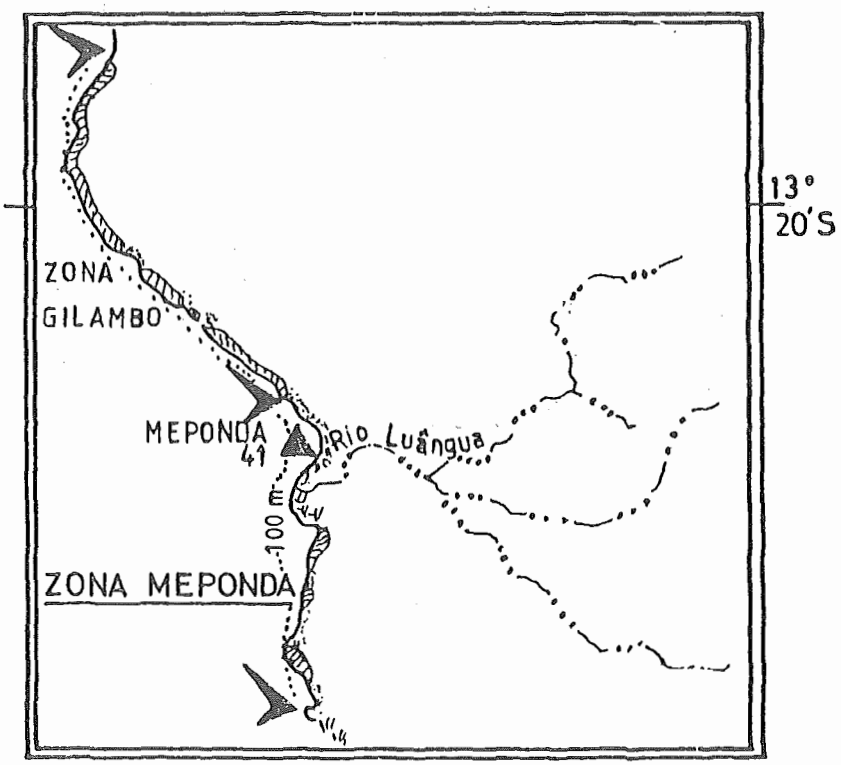

FIG. 2 g Gilambo and Meponda zones

Rocky

Sandy

Phragmites mauritianus

Fishing centres

Zone limits

APPENDIX I

SCHEDULE OF THE FRAME SURVEY OF THE FISHING CENTRES OF LAKE NIASSA (MOZAMBIQUE) IN JUNE 1983

Zone	Ref. Nº. Map	Fishing Centre	Latitude	Longitude	June 1983 day
1. NHIAMBO	01	CHIUINDI	11° 34' 10" S	34° 57' 30" E	5
	02	UIQUI	11 36 40 S	34 57 19 E	5
	03	UNGUI	11 39 40 S	34 58 00 E	5
	04	LIUCHE	11 42 08 S	34 57 30 E	5
	05	NEGOMBE	11 43 34 S	34 57 00 E	6
	06	UNGA	11 46 20 S	34 57 00 E	6
	07	LUMBAULO	11 51 30 S	34 55 33 E	6
	08	MANHAI	11 53 30 S	34 55 00 E	6
2. CHIGOMA	09	N'TUMBA	11 56 40 S	34 53 40 E	7
	10	N'GOFI	11 59 00 S	34 53 30 E	7
	11	CHIGOMA	12 02 33 S	34 52 40 E	7
	12	MATACA	12 04 35 S	34 48 20 E	8
	13	CHILOLA	12 06 10 S	34 48 30 E	8
	14	COBUE	12 08 15 S	34 45 15 E	8
	15	Pta. MALA	12 11 40 S	34 42 10 E	8
3. M'BUECA	16	M'BUECA	12 16 20 S	34 42 36 E	9
	17	LIMBUE	12 23 00 S	34 42 20 E	9
4. N'GO	18	N'GO	12 25 10 S	34 42 05 E	10
	19	CHISSANGA	12 27 20 S	34 42 30 E	10
	21	CHICOA	12 29 00 S	34 43 00 E	11
	22	CHIA NORTE/	12 30 00 S	34 42 00 E	11
		/CENTRO	12 31 18 S	34 44 00 E	
	23	CHIA SUL	12 31 35 S	34 43 15 E	11
	24	MBAMBA	12 32 47 S	34 45 09 E	11
	20	MONDUE	12 35 00 S	34 46 00 E	10
	25	MESSUNDA	12 36 10 S	34 46 20 E	12
	26	XUANGA	12 39 33 S	34 47 30 E	12

Zone	Ref. Nº. Map	Fishing Centre	Latitude	Longitude	June 1983 day
5. METANGULA	27	METANGULA-SELI	12° 41' 12" S	34° 48' 20" E	13
	28a	METANGULA-COOP	12 42 20 S	34 49 00 E	13
	28b	METANGULA-B.NAVAL	12 42 20 S	34 49 00 E	13
	28c	METANGULA-C.PESQUEIRO	12 42 20 S	34 49 00 E	13
	29	METANGULA-THUNGO	12 42 25 S	34 49 00 E	13
	30	MICUIO	12 44 10 S	34 49 03 E	14
	31	MALANGO	12 46 31 S	34 47 40 E	14
	32	N'KOLONGWE	12 47 10 S	34 47 22 E	14
	33	N'TCHEPA	12 48 40 S	34 47 10 E	15
	34	MELULUCA	12 53 00 S	34 46 10 E	15
	35	LUSSEFA	12 55 10 S	34 45 20 E	15
6. CHILOBELO	36	UKUNGO	12 57 40 S	34 45 40 E	15
	37	CHINUNE	13 03 15 S	34 47 45 E	16
	38	TIMBA	13 05 32 S	34 48 30 E	16
	39	CHILOBELO	13 12 43 S	34 48 40 E	16
	40	MATUMBUE	13 17 37 S	34 48 10 E	17
7. MEPONDA	41a	MEPONDA	13 24 40 S	34 51 45 E	17
	41b	MEPONDA-COOP	13 24 40 S	34 51 45 E	17

APPENDIX II

QUESTIONNAIRE USED IN THE FRAME SURVEY OF THE FISHING CENTRES OF LAKE NIASSA (MOZAMBIQUE) IN JUNE 1983

RECONHECIMENTO AOS CENTROS DE PESCA

NOME DO REGISTADOR: _____

DATA DO RECONHECIMENTO: ___/___/___ NÍVEL DO LAGO: _____

A. Identificação do Centro de Pesca

1. NOME(S) DO CENTRO: _____
2. GRUPO ÉTNICO(S) DOS PESCADORES: _____
2.1. Dialecto(s) utilizados: _____

B. Estrutura Orgânica do Centro de Pesca

1. Organização dos pescadores: ☐ Cooperativa Nº.____
☐ Privados Nº._____

2. Os pescadores residem no Centro:

☐ Permanentemente

☐ Transitoriamente

☐ Não residem

3. A actividade dos pescadores no centro durante o ano é:

☐ Contínua Nº. de Pescadores

☐ Ocasional Nº. de Pescadores

Período _____

Duração _____

Tipo de actividade alternativa _____

_____

C. História Migratória

1. Período em que se começou a actividade piscatória ____
_____

2. Actividade dos Pescadores antes deste período _____
_____
_____

D. Período de Pesca	1. Pescam durante todo o ano ☐ Sim ☐ Não 2. Período de maior actividade Piscatória: _____ _____
E. Pescadores	1. Nº. Total de Pescadores: _____ 2. Nº. Total de Pescadores Proprietários de embarcações: _____ 3. Nº. de embarcações por proprietário: _____ _____ 4. Nº. de Ajudantes de Pescador: _____
F. Sistemas, Equipamento e Artes de Pesca utilizadas	1. Artes de Pesca utilizadas: Rede de emalhar desde _____ "Até _____" Armadilhas desde _____ "Até _____" Pesca à linha desde _____ "Até _____" Palangre desde _____ "Até _____" Chilimila desde _____ "Até _____" Rede de arrasto para praia desde _____ "Até _____" Outras desde _____ "Até _____" 2. Características das artes e respectivas zonas de pesca: _____

2.1. Rede de emalhar

Tamanho de Malha (")	Número total de redes	Número de redes por Embarcação	Comprimento (m)	Altura	Coeficiente de Montagem	Material	Captura média	
							Melhor época	Pior época
2								
2 1/2								
3								
3 1/2								
4								
5								
6								

2.1.1. Principais espécies capturadas _____

_____

_____

_____

_____

_____

_____

2.1.1. Observações: _____

_____

_____

_____

_____

2.2. Outras artes:

2.2.1. Armadilhas:

Número _____

Material _____

Dimensões _____

Lugar de Pesca _____

Captura média: melhor época _____

_____

pior época _____

_____

Principais espécies capturadas: _____

_____

_____

_____

_____

2.2.1.1. Observações _____

_____

2.2.2. Pesca à linha:

Número de linhas _____

Diâmetro do fio _____

Tamanho do anzol _____

Lugar de pesca _____

Captura média: melhor época _____

pior época _____

Principais espécies capturadas: _____

_____

_____

_____

2.2.2.1. Observações _____

_____

2.2.3. Palangre:

Número _____

Linha principal: comprimento _____ Diâmetro _____

Quantidade de anzóis _____ Tamanho dos anzóis __

_____

Espaço entre os anzóis _____

Lugar de pesca _____ Profundidade _____

Distância da costa (m ou horas de remos)_____

Captura média: melhor época _____

pior época _____

Principais espécies capturadas _____

_____

Observações _____

_____

_____

2.2.4. Chilimila:

Número _____

Dimensões _____

Tamanho da malha _____

Zona de pesca _____ Profundidade _____

Distância da costa (m ou horas de remos) _____

Captura média: melhor época _____

pior época _____

Principais espécies capturadas _____

_____

_____

_____

Observações _____

_____

_____

2.2.5. Rede de arrasto para praia:

Número de redes _____

Dimensões _____

Tamanho da malha _____

Zona de pesca _____ Profundidade _____

Distância da costa (m ou horas de remos) _____

Captura média: melhor época _____

pior época _____

Principais espécies capturadas _____

_____

_____

_____

_____

Observações _____

_____

_____

_____

_____

_____

G. Embarcações de Pesca

	Tipo
	Número
	Material de Construção
	Duração média
	Idade Actual
	Custo unitário
	Dimensões
	Tipo de propulsão
	Nº. de tripulantes
	Observações

H. Destino das Capturas

1. Utilização das capturas:

   Consumo directo no centro _____%

   Comercialização noutras áreas _____%

2. Tipo de processamento:

   Pescado para consumo directo: Fresco _____%

   Seco _____%

   Seco salgado ____%

   Fumado _____%

   Pescado para comercialização:

	%	Preço por kg ou peça
Fresco		
Seco		
Seco salgado		
Fumado		

3. Observações _____

_____

_____

_____

_____

APPENDIX III

ESTIMATED NUMBER OF FISHERMEN, BOATS AND GEAR IN EACH FISHING CENTRE OF LAKE NIASSA (MOZAMBIQUE) IN JUNE 1983

Zone	Ref. Nº. Map	Fishing Centres	Fishermen			Fishing Boats			Fishing Gear					
			Total	Proprietors	Assistants		Non motorized	Motorized	Chilimila nets	Beach Seines	Gill nets	Long lines	Hand lines	Traps
1. NHAMBO	01	Chiundi	27	9	18	9	9		3	-	22	-	-	1
	02	Uiqui	90	30	60	60	30		10	1	38	-	-	-
	03	Unqui	36	12	24	12	12		6	-	6	1	-	-
	04	Liuche	27	9	18	9	9		6	-	11	1	-	-
	05	N'gombe	39	19	20	9	9		4	-	33	3	-	-
	06	Unqu	11	3	8	4	9		1	-	5	1	3	-
	07	Lumbaulo	15	5	10	10	5		3	-	5	2	3	2
	08	Manhai	29	9	20	10	10		4	-	2	-	10	-
		Total	274	96	178	88	88		37	1	122	8	16	3
2. CHIGOMA	09	N'tumba	90	30	60	30	30		11	-	47	7	40	-
	10	N'gofi	450	150	300	150	150		26	-	38	9	300	20
	11	Chigoma	107	25	82	41	41		16	4	49	7	70	22
	12	Mataca	53	17	36	18	28		2	2	31	7	25	10
	13	Chilola	24	8	16	8	8		8	1	24	4	20	4
	14	Cobue	78	24	54	27	27		3	1	46	17	100	5
	15	Ponta Mala	12	4	8	4	4		2	-	3	5	3	4
		Total	814	258	556	278	278		68	8	238	56	558	65
3.M'BUECA	16	M'bueca	61	25	36	25	25		8	1	15	13	15	50
	17	Limbue	17	5	12	6	6		-	-	12	4	7	8
		Total	78	30	48	31	31		8	1	27	17	22	58
4. N'GO	18	N'go	89	22	67	28	28		6	4	32	4	29	24
	19	Chissanga	157	37	120	60	60		-	3	39	10	40	50
	20	Mondue	48	16	32	16	16		-	1	18	7	30	50
	21	Chicoa	4	4	-	-	-		-	-	-	-	-	19
	22	Chia Norte/Centro	303	124	180	36	36		-	5	4	20	20	250
	23	Chia Sul	60	20	40	20	20		-	1	35	12	100	60
	24	Mbamba	149	45	104	52	52		2	1	19	17	20	3
	25	Messunda	39	13	26	13	13		-	-	25	7	9	3
	26	Xuanga	85	35	50	35			-	6	73	50	60	19
		Total	934	315	619	260	260		8	21	245	127	308	478
5. METANGULA	27	Seli	38	12	26	13	13		4	1	32	4	40	-
	28	Metangula/Coop	12	-	12	4	-	4	1	2	5	-	-	-
	28	Metangula/B.N.	20	-	20	1	-	1	-	1	12	1	-	-
	28	Metangula/C.P.	64	-	64	10	-	10	5	-	6	2	-	-
	29	Thungo	47	30	17	14	14		3	1	9	3	30	8
	30	Micuio	45	13	32	16	16		1	-	24	4	17	1
	31	Malango	36	12	24	12	12		1	1	10	10	15	-
	32	N'kolongwe	40	14	26	13	13		4	1	4	3	7	-
	33	N'tchepa	27	11	16	11	11		-	1	20	9	7	-
	34	Meluluca	108	32	38	38	32	6	13	2	44	3	8	7
	35	Lussefa	183	48	135	48	48		5	-	75	15	5	-
		Total	120	172	448	180	159	21	37	10	241	54	129	16
6. CHILOBELO	36	Ukungo	75	25	50	25	25		2	3	33	10	3	3
	37	Chinune	27	9	18	9	8	1	1	-	8	4	5	-
	38	Timba	50	31	19	35	35		1	6	40	18	10	-
	39	Chilobelo	125	63	62	75	75		11	-	63	3	1	1
	40	Matumbue	100	40	43	43	42	1	3	4	54	13	-	-
		Total	377	168	209	187	185	2	18	13	198	48	19	4
7. MEPONDA	41	Meponda/Coop.	12	-	12	4	2	2	1	-	-	-	-	-
	41	Meponda	274	60	214	200	200		10	3	66	30	400	30
		Total	286	60	226	204	202	2	11	3	66	30	400	30
TOTAL			3383	1099	2284	1228	1203	25	187	57	1137	340	1452	654

APPENDIX IV

ESTIMATED MONTHLY CATCHES (IN TONS) IN LAKE NIASSA, FOR THE THREE FISHING GEAR CONSIDERED

RAINY SEASON

Zone	Fishing Centre	Chilimila nets	Beach Seines	Gill nets	Total
1. Nhiambo	Chiwindi	32,0	x	1,6	33,6
	Uiqui	40,0	4,0	1,6	45,6
	Ungui	32,0	x	1,8	33,8
	Liuche	48,0	x	2,0	50,0
	N'gombe	32,0	x	2,4	34,4
	Unga	48,0	x	4,0	52,0
	Lumbaulo	64,0	x	5,6	69,6
	Khanani	48,0	x	0,1	48,1
2. Chigoma	N'tumba	64,0	x	0,5	64,5
	N'gofi	20,0	x	1,5	21,5
	Chigoma	60,0	32,0	1,1	93,1
	Mataca	64,6	14,0	4,0	82,6
	Chilola	64,0	16,0	1,6	81,6
	Cobue	48,0	0,8	1,5	50,3
	Ponta Mala	56,0	x	11,7	67,7
3. M'bueca	M'bueca	64,0	16,0	2,4	82,4
	Limbue	x	x	1,2	1,2
4. N'go	N'go	12,0	2,7	1,4	16,1
	Chissanga	x	1,5	0,8	2,3
	Mondue	x	32,0	0,8	32,8
	Chicoa	x	x	x	-
	Chia Norte/Centro	x	16,0	2,2	18,2
	Chia Sul	x	4,0	0,8	4,8
	Mbamba	15,1	2,4	2,1	19,6
	Messumba	x	x	0,1	0,1
	Xuanga	x	2,0	2,5	4,5
5. Metangula	Soli	15,0	1,0	0,4	16,4
	Metangula	13,0	7,0	1,4	21,4
	Thungo	32,0	3,6	2,2	37,8
	Micuio	64,0	x	2,0	66,0
	Malango	4,8	2,4	2,0	9,2
	N'kolongwe	32,0	2,4	1,6	36,0
	N'tchepa	x	2,0	0,5	2,5
	Meluluca	48,0	32,0	1,6	81,6
	Lussefa	10,0	x	0,8	10,8
6. Chilobelo	Ukungo	32,0	32,0	0,4	64,4
	Chinune	6,5	x	3,2	9,7
	Timba	2,5	1,6	1,2	5,3
	Chilobelo	20,0	x	1,2	21,2
	Matumbwe	20,0	0,8	0,3	21,1
7. Meponda	Meponda	25,0	5,6	2,0	32,6
Total		1136,0	233,8	76,1	1446,4

DRY SEASON

Zone	Fishing Centre	Chilimila nets	Beach Seines	Gill Nets	Total
1. NHIAMBO	Chiwundi	1,0	x	0,1	1,1
	Uiqui	1,5	0,9	0,1	2,5
	Ungui	1,0	x	0,1	1,1
	Liuche	1,5	x	0,1	1,6
	N'gombe	1,3	x	0,1	1,4
	Unga	1,5	x	0,2	1,7
	Lumbaulo	1,5	x	0,2	1,7
	Khanani	0,5	x	0,02	0,5
2. CHIGOMA	N'tumba	1,0	x	0,1	1,1
	N'gofi	2,5	x	0,1	2,6
	Chigoma	1,5	1,0	0,2	2,7
	Mataca	2,3	1,8	0,4	4,5
	Chilola	1,5	1,0	0,2	2,7
	Cobue	1,0	0,2	0,1	1,3
	Ponta Mala	1,0	x	1,8	2,8
3. M'BUECA	M'bueca	2,0	1,0	0,3	3,3
	Limbwe	x	x	0,1	0,1
4. N'GO	N'go	2,0	1,4	0,3	3,7
	Chissanga	x	0,3	0,1	0,4
	Mondue	x	0,5	0,1	0,6
	Chicoa	x	x	x	-
	Chia Norte/Centro	x	0,3	0,3	0,6
	Chia Sul	x	0,5	0,2	0,7
	Mbamba	1,1	0,6	0,3	2,0
	Messunda	x	x	0,04	0,04
	Xuanga	x	1,0	0,2	1,2
5. METANGULA	Seli	1,0	0,3	0,1	1,4
	Metangula	2,0	1,4	0,4	3,8
	Thungo	1,5	0,4	0,4	2,3
	Micuio	1,0	x	0,3	1,3
	Malango	1,0	0,5	0,1	1,6
	N'kolongwe	0,8	0,2	0,3	1,3
	N'tchepa	x	0,2	0,2	0,4
	Meluluca	1,6	0,8	0,4	2,8
	Lussefa	0,8	x	0,1	0,9
6. CHILOBELO	Ukungo	2,0	0,1	0,1	2,2
	Chinune	1,2	x	0,8	2,0
	Timba	0,6	0,4	0,4	1,4
	Chilobelo	1,2	x	0,6	1,8
	Matumbwe	1,2	0,1	0,1	1,4
7. MEPONDA	Meponda	4,0	0,8	0,4	5,2
Total		45,6	15,7	10,5	71,8