GCP/RAF/271/FIN-TD/58(En) February 1997

Reports of Travel 76 - 90 of the project GCP/RAF/271/FIN

by

G. Hanek
(ed.)

FINNISH INTERNATIONAL DEVELOPMENT AGENCY

FOOD AND AGRICULTURAL ORGANIZATION
OF THE UNITED NATIONS

Bujumbura, February 1997

PREFACE

The Research for the Management of the Fisheries on Lake Tanganyika project (LTR) 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 Development Agency (FINNIDA) and the Arab Gulf Programme for the United Nations Development Organizations (AGFUND).

LTR's objective is 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 is 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 build-up of effective coordination mechanisms to ensure full collaboration between the Governments concerned.

Prof. O.V. LINDQVIST
LTR Scientific Coordinator

Dr. George HANEK
LTR Coordinator

LAKE TANGANYIKA RESEARCH (LTR)
FAO
B.P. 1250
BUJUMBURA
BURUNDI

Telex: FOODAGRI BDI 5092

Tel: (257) 22.97.60

Fax: (257) 22.97.61

GCP/RAF/271/FIN PUBLICATIONS

Publications of LTR are issued in two series:

* a series of technical documents (**GCP/RAF/271/FIN-TD**) related to meetings, missions and research organized by the project; and

* a series of working papers (**GCP/RAF/271/FIN-WP**) related to more specific field and thematic investigations conducted in the framework of the project.

For both series, reference is further made to the document number (**01**), and the language in which the document is issued: English (**En**) or French (**Fr**).

For bibliographic purposes this document should be cited as follows:

Hanek, G. Reports of Travel 76 - 90 of the Project
1997 GCP/RAF/271/FIN FAO/FINNIDA Research for the Management of the Fisheries of Lake Tanganyika **GCP/RAF/271/FIN-TD/58(En): 91p.**

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TRAM/76 is missing

D.B.R. Chitamwebwa. Reports of Travel to Dar es Salaam Tanzania (16-29.02.1996)

RESEARCH FOR THE MANAGEMENT OF THE FISHERIES ON LAKE TANGANYIKA
GCP/RAF/271/FIN

GCP/RAF/271/FIN/TRAM/77

Report of Travel

to

Dar es Salaam, Tanzania
(23–30.03.1996)

by

George Hanek
LTR Coordonator

GCP/RAF/271/FIN.10

cc: Mann, TCO4
Kapetsky, FIRI
Everett, FIPP
Karnbona/Ssentongo, FIPL
Turner/Smith, FIIT
FAOR - URT
Maembe, DOF/Dar
Bwathondi, TAFIRI/Kunduchi
Rantakari, Finnish Embassy/Dar
Menz/Banister, NRI
Lindqvist/Mölsä/Huttula, LTR/Kuopio & Tampere
Chitamwebwa, TAFIRI/Kigoma
All LTR Stations
Chrono
Diary: Hanek

GCP/RAF/271/FIN **April, 1996**

1. INTRODUCTION

1.1 Objective

The objectives of this duty travel were: (1) to take part in the 'inception meeting' of GEF/NRI project; and (2) to meet FAOR, Director of Fisheries, DC of TAFIRI and Finnish Ambassador.

1.2 Itinerary

	Arrival	Departure
Bujumbura		23.3.1996
Dar es Salaam	23.3.1996	30.3.1996
Bujumbura	30.3.1996	

1.3 Persons met

all participants of GEF/NRI 'inception meeting'

Dr. J. Hough	Coordinator for Biodiversity, UNDP/NY
Ms. K. Svadlenak	Project Management Officer, UNOPS/NY
Dr. P. Alleyne	FAO Representative
Mr. J. Yonazi	FAO Programme Officer
Mr. T.W. Maembe	Director of Fisheries
Prof. P. Bwathondi	DG of TAFIRT

2. RESULTS

2.1 RAF/92/G32 (GEF/NRI) inception meeting

This meeting was held in the British Council meeting facilities in Dares—salaam from 25 to 28.3.1996. PAF/92/G32 headquarters is also in this building, which, according to one meeting participant, is the last relic of the British Empire in the URT. Some 50+ persons took part in this meeting (delegations of all four riparian States, UNDP/NY and URT, UNOPS, NRI staff and others) which had three objectives: (1) to ensure that the background and origin of the project are well understood; (2) to identify the strategy, agency involvement and coordination mechanism for Phase 2 Special Studies; and (3) to formulate a preliminary management strategy encompassing the correspondent stakeholder involvement (agencies, ministries, partners) necessary to translate the Phase 2 research findings into realistic management activities during Phase 3.

The meeting itself was 'managed' by a 'facilitator' ($1,000/day US management consultant, a 'Jan Johnson type', who frequently inquired how each participant feels..; my initial worry that the meeting will end with all of us holding hands singing project's song did not fortunately materialize) who made an effective use of clip boards and other signs throughout the meeting and, resultingly, the meeting room resembled an early Chinese style dry cleaners shop. The agenda was full as all the baseline studies were presented using 'gallery walk' and 'open space processes. There was no 'FAO style' meeting's report nor its adoption as it was agreed that the final version, which will include a number of corrections, additions, etc., will be presented during the First Steering Committee meeting

tentatively scheduled for May 1996. This report should also include operational specifics, including cruise schedule and costing for the use of *R/V Tanganyika Explorer.* I was asked to explain (a) contractual arrangements between La Tanganyikaise SARL and FAO and (b) to provide update on the Inter-Agency Agreement UNOPS/FAO during a parallel meeting of GEF/NRI National Coordinators, Project Coordinator and UNDP/GEF and UNOPS Representatives. The meeting was satisfied with explanations and arrangements made by LTR. In addition, Drs. Menz and Patterson were given copies of Dr. Huttula's fax requesting NRI to specify, as soon as possible, where to geographically concentrate the modelling and field studies under the terms of the Inter-Agency Agreement; it was agreed that this information will be faxed to LTR/Bujumbura soon. Lastly, and of interest to LTR was the position of the Burundese delegation. It concerns mainly the issue of project headquarters and other aspects. These matters were dealt with by the same body and the summary is now attached as Appendix 1.

2.2 Other matters

Several other meetings were held as follows:

with FAO Representative and his staff - FAOR was briefed on LTR progress and on the conclusions of GEF/NRI inception meeting. In addition, the forthcoming 5th Joint Meeting of LTR Committees and the 7th Session of CIFA Sub-Committee for Lake Tanganyika, both scheduled for Kigoma (23-27.9.1996) were discussed. It was explained that most of the required arrangements were already made; in fact and although Mr. Chitamwebwa already contacted the Town Director re: use of town hall (see Appendix 2), it would seem that a new hotel in Kigoma should be completed soon. Consequently, my staff there was already directed to provide the details, etc. on this possibility. In addition, we have discussed who should be invited and agreed that such a list is proposed as soon as possible (Dr. Hough, Ms. Svadlenak, Dr. Menz and FAOR must be on the list; official invitation should also be sent, through FAOR, to Dr. Juma Ngasonga, Minister of Tourism, Natural Resources and Environment) . Lastly, it was stressed and agreed that the arrangements, including the costing, for the translation equipment must be made soonest.

with the Director of Fisheries - two meetings were held. It was agreed that Mr. Maembe, with Mr. Yonazi's assistance, will confirm the availability of 'translating equipment' for our September 1996 meetings in Kigoma. Most of our discussions centered on our Kigoma meetings and, particularly, on their agenda. Mr. Maembe would prefer to have a 'broad document based on desk study' on the establishment of the Lake Tanganyika Fisheries Organization ready for the meetings. Several possibilities were discussed and it was agreed that (a) he provides me with details on his time availability (possibility of Author's contact for Mr. Maembe to prepare such a study) . In turn I have promised to take this matter with TCO4, FIPP, FIPL and LEG and inform him soonest.

with the representatives of UNDP/GEF and UNOPS - I met with Dr. John L. Hough, Coordinator for Biodiversity and International

Waters (UNDP/GEF) and with Ms. Karin Svadlenak, Project Managment Officer (UNOPS) . It was agreed that (a) LTR prepares work programme for water circulation model and (b) information on progress with equipment procurement and other relevant matters should be copied to both.

with the Finnish Ambassador – did not take place as Mr. Rantakari was in Finland. Consequently, I have left a long memo at the Embassy providing an up date on LTR activities. I have also requested his assistance in obtaining earliest possible decision from FINNIDA re: level of funding for LTR's second phase.

with the Executive Secretary of GEF/Lake Victoria – I met with Mr. Saidi B. Mbwana, briefed him on LTR, etc. He provided me with a copy of the final report entitled 'Lake Victoria Environmental Management Program Proposal' which was submitted by the three Governments to the World Bank in January 1996. It was agreed to exchange documentation, etc.

3. CONCLUSIONS AND FOLLOW-UP

3.1 Maintain contact with Dr. Andy Menz, Project Coordinator of GEF/NRIproject (Action: LTR Coordinator)

3.2 Provide details on site selections for modelling and field studies under the Inter–Agency Agreement (Action: Drs. Menz and Patterson)

3.3 Prepare Work Programme for water circulation modelling (Action: Dr. Huttula and LTR Coordinator)

3.4 Prepare agenda and list of participants for the 7th Session of CIFA SubCommittee for Lake Tanganyika (Action: Ssentongo, FIPL)

3.5 Prepare agenda for the 5th Joint Meeting of LTR Committees (Action: LTR Coordinator)

3.6 Prepare 'baseline document' on the establishment of Lake Tanganyika Fisheries Organization (Action: Mr. Maembe, LTR Coordinator, TCO4, FIPP, FIPL and LEG)

3.7 Obtain permission to use the Municipal Hall in Kigoma for 23-26.9.1996 and/or make alternative arrangements (new hotel) (Action: Mr. Chitamwebwa).

3.8 Arrange for the construction of two interpreters booths exactly as per Appendix 3 (Action: Messrs. Mannini and Chitamwebwa)

3.9 Maintain contact with Mr. Saidi Mbwana, Executive Secretary of Lake Victoria Environmental Managment Program (Action: LTR Coordinator)

Appendix 1

SUMMARY OF TRIPARTITE MEETING
(NATIONAL COORDINATORS, UNDP/GEF AND COORDINATOR OF PROJECT RAF/92/G32) DAR ES SALAAM (26.3.1996)

On 26.3.1996 the National Coordinators of project RAF/92/G32 together with the Representatives of UNDP/GEF and Project Coordinator met in the British Council offices in Dar es Salaam and treated the following matters:

1. project organization

2. location of project's headquarters

3. projects' s activities

4. cooperation with project LTR (FAO/F1NNIDA.GCP/RAF/FIN/271)

After detailed discussions the following was agreed:

1. Project organization

The project will have two committees:

(A) Steering Committee: its composition will be the following: 3 persons per each riparian country, 1 Representative of UNDP/GEF, Project Coordinator and 4 National Coordinators

(b) Regional Technical Conunittee: its composition will be the following: *5* persons per riparian country and Project Coordinator

The Chairmanship of both Committees will be assumed by the riparian States, on rotation basis. The secretariat will be the responsibility of the Project Coordinator.

The meetings of the Regional Technical Committee will be followed by the meetings of the project's Steering Committee. The exception is the first meeting of the project's Steering Committee which should be held as soon as possible and which will be chaired by the Representative of UNDP/GEF.

2. Project's headquarters

The participants agreed that the effective project's headquarters remains to be Bujumbura as per Project Document. However, the present location of project's headquarters is, temporary, in the facilities of the Division of Environment in Dar es salaam.

3. Project's activities

The project activities should start simultaneously in all four riparian countries as stipulated in the Project Document. The project documents must be made available in project's official languages i.e. in French and English.

4. Cooperation with project LTR (FAO/FINNIDA GCP/RAF/271/FIN)

The participants recorded the necessity for cooperation between both projects particularly in the utilization of research vessel *R/V Tanganyika Explorer*. They have charged the Project Coordinator to present the schedule for its use and its costing which must be presented during the next meeting of the project's Steering Committee.

The meeting closed in perfect harmony.

TANZANIA FISHERIES RESEARCH INSTITUTE

Tel. 3625
Telegram "TAFIRI" KIGOMA

Kigoma centre,
P.O. Box 90,
KIGOMA.

Ref.No. TAF/KGM/C.20/4/82

20.03.1996.

The Town Director,
Kigoma/Ujiji,
P.O. Box ,
KIGOMA.

Re: REQUEST FOR USE OF THE TOWN HALL

The meetings of the FAO Committee for Inland Fisheries in Africa (CIFA), Lake Tanganyika Sub-committee and the 5th Joint Meeting of the Coordination and Research Committees of the FAO/Finnida Lake Tanganyika Research Project are scheduled to be held at Kigoma from 23 to 26 September, 1996. Your hall has been earmarked as the appropriate venue for these important international meetings.

Would you please let us know if the said premises would be available and the terms and conditions of their tenure so that further preparations could be done ?

Thank you for your concern.

Yours sincerely,

D.B.R. Chitamwebwa
Ag. Centre Director
TAFIRI Kigoma

c.c. Director General,
TAFIRI,
P.O. Box 9750,
DAR ES SALAAM.

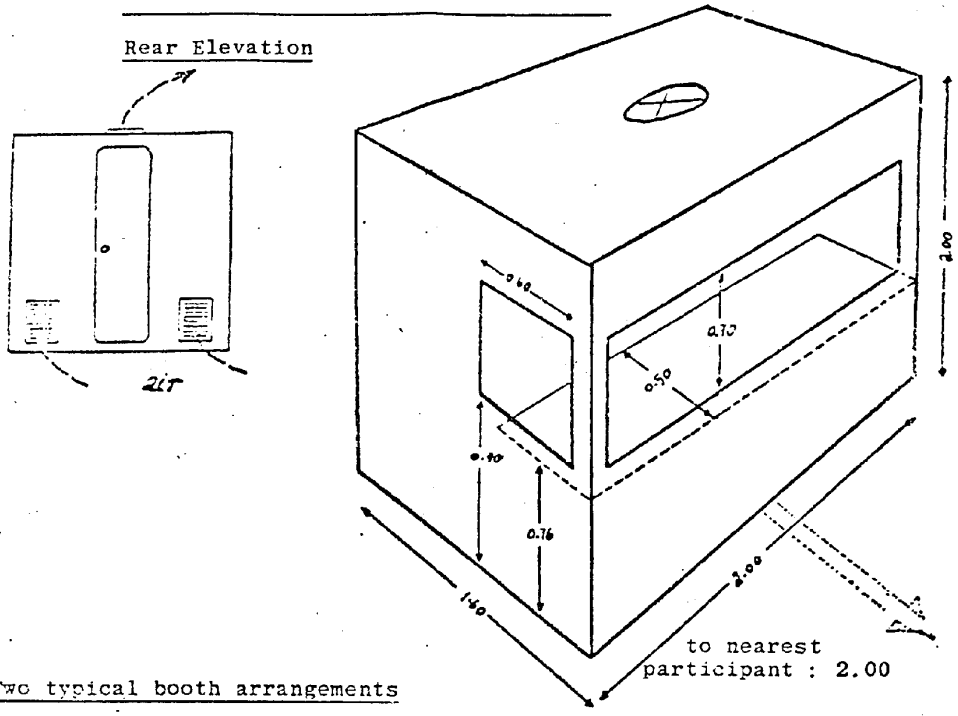
" " Dr. G. Hanek,
LTR Coordinator
P.O. Box 1252,
BUJUMBURU, Burundi.

" " Director of Fisheries,
P.O. Box 2462,
DAR ES SALAAM.

DBRC/gb.

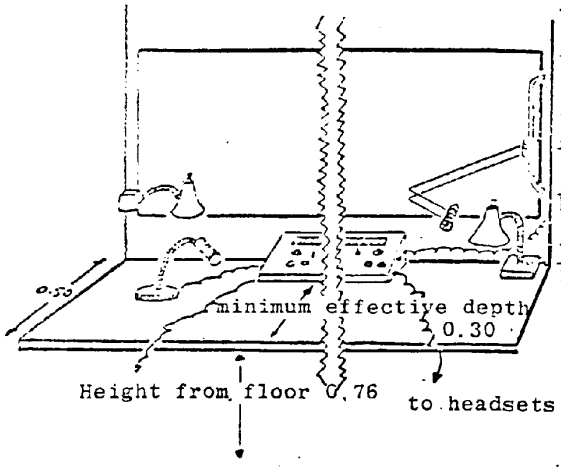
I N T E R P R E T E R S' B O O T H

Rear Elevation



Two typical booth arrangements

Microphones and lamps should have some form of flexible neck.



N O T E S

Windows : double glazed; front window right across booth;

Table : strong enough to take weight of control panel + documents + two interpreters leaning on it: minimum effective depth 0.30; table extends right across booth;

Access : Outward opening rear door or heavy curtain;

Ventilation : silent roof fan; rear intake vents.

N.B. : Care should be taken not to place the booths anywhere that would hinder exit in case of emergency.

GCP/RAF/271/FIN/TRAM/78

Report of Travel

of

**the 7th Scientific Cruise
(02.04–12.04.1996)**

by

P. Kotilainen, I. M. Kitmosa, R.E. Makere and N. A. Chale

GCP/RAF/271/FIN.10

cc: Mann, TCO4
Kapetsky, FIRI
Turner/Smith, FIIT
All LTR Stations
SSP
Chrono
TRAMS
Diary: Kotilainen

FORM TE/3

LAKE TANGANYIKA RESEARCH

1995 RESEARCH VESSEL PROGRAMME

PROGRAMME: *R/V TANGANYIKA EXPLORER* CRUISE 07

NAME	POSITION
1. Kotilainen, P	Fish biologist, cruise leader.
2. Mannini, P	Fish biologist
3. Paffen, Petra	Fish biologist
4. Katonda, P	Fish biologist
5. Mambona wa Bazolana, C	Fish biologist
6. Kissaka, M	Fish biologist
7. Ndimunzigo, B	Fish biologist
8. Zomba, P	Fish biologist

DURATION 02-19.04.96

LOCALITY
1. Bujumbura 02.04
2. Kigoma 06.04
3. Mpulungu 15.04
4. Kigoma 18.04
5. Bujumbura 19.04

PLAN (all times are Greenwich Mean Time + 2)

LTR Coordinator

Date:0l. 04. 1996

INITIALLED GH

DISTRIBUTION: Mann, TCO4
Kapetsky, FIRI
Turner/Smith, FIIT
Chrono
Diary: Hanek

SHIP: *R/V TANGANYIKA EXPLORER* CRUISE NUMBER: 07/96

CRUISE ITINERARY REqUIRED: (start, stop. Port call(s) track chart)

1. Departure from Bujumbura 02.04.
2. Arrival in Kigoma 06.04 and departure from Kigoma 07.04.
3. Arrival in Mpulungu 14.04 and departure from Mpulungu 15.04.
4. Arrival in Kigoma 18.04 and departure from Kigoma 18.04.
5. Arrival in Bujumbura 19.04

SENIOR SCIENTIST: Mr. P. Kotilainen Fish biologist
Mr. P. Mannini LTR/Kigoma

SCIENTIFIC STAFF LIST: (including affiliation)

			DATES	
Name	Laboratory	Institution	Boarding	Disembarking
Kotilainen,	P.Hydroacoustics	LTR/Bujumbura Cruise leader	Bujumbura 02.04.96	Bujumbura 19.04.96
Mannini, P.	Fish biology	LTR/Kigoma	Kigoma 07.04.96	Kigoma 18.04.96
Paffen, P.	Fish biology	LTR/Mpulungu	Bujumbura 02.04.96	Kigoma 18.04.96
Katonda, P.	Fish biology	LTR/Kigoma	Bujumbura 02.04.96	Kigoma 18.04.96
Ndimuzigo, B.	Fish biology	LTR/Bujumbura	Bujumbura 02.04.96	Bujumbura 19.04.96
Mambona wa Bazolana, C.	Fish biology	LTR/Uvira	Bujumbura 02.04.96	Bujumbura 19.04.96
Kissaka, M.	Fish biology	LTR/Kigoma	Bujumbura 02.04.96	Kigoma 18.04.96
Zomba, P.	Fish biology	LTR/Mpulungu	Kigoma 02.04.96	Kigoma 18.04.96

EQUIPMENT TO BE USED:

1. Equipment supplied by LTR/Bujumbura
   Mid-water trawl
   Scientific echosounder EY500
   HP PaintJet printer
   Limnos water sampler, 7.4 liters
   GULF V sampler for larvae sampling
   Plankton net l00µm
   Plankton torpedoes
   Equipment for fish biology sampling and preservation
   One electrical balance (Eilersen)
   Microscope

2. Equipment supplied by LTR/Kigoma Tape streamer
   Equipment for fish biology sampling and preservation

3. Equipment from other sources:
   Spring balance (50 kgs)
   Printing paper for HP Paintjet
   Color and black ink cartridges

5. Winch and wire requirements.
   Trawl winch wire used 100-550m
   Oceanographic winch 300 meters

SCIENTIFIC OR SURVEY OBJECTIVES:

To obtain:

1) data on spatial distribution and abundance estimates of target species, *i. e.* *Stolothrissa tanganyicae* and *Limnothrissa miodon* and four *Lates* species, *L. marie, L. angustifrons, L. microlepis* and *L. stappersii*.

2) Information on the demographic structure of the target species, their sex ratios and maturity stages.

3) Information about feeding and predator-prey interactions of target species.

CRUISE PROCEDURES AND STATION PATTERN REQUIRED:

FORM TE/5

CRUISE SUMMARY

SHIP: *RV/TANGANYIKA EXPLORER* CRUISE NUMBER: 07

SENIOR SCIENTIST(S): Kotilainen, P. and P. Mannini

LIST OF SCIENTIFIC STAFF ACTUALLY PARTICIPATING

SENIOR SCIENTIST(S):	Mr. P. Kotilainen	Fish biologist
	Mr. P. Mannini	Fish biologist, LTR/Kigoma

SCIENTIFIC STAFF LIST: (including affiliation)

			DATES	
Name	Laboratory	Institution	Boarding	Disembarking
Kotilainen, P.	Hydroacoustics	LTR/Bujumbura Cruise leader	Bujumbura 02.04.96	Bujumbura 12.04.96
Mannini, P.	Fish biology	LTR/Kigoma	Kigoma 07.04.96	Kigoma 11.04.96
Paffen, P.	Fish biology	LTR/Mpulungu	Bujumbura 02.04.96	Lagosa 11.04.96
Katonda, P.	Fish biology	LTR/Kigoma	Bujumbura 02.04.96	Kigoma 11.04.96
Ndimuzigo, B.	Fish biology	LTR/Bujumbura	Bujumbura 02.04.96	Bujumbura 12.04.96
Mambona wa Bazolana, C.	Fish biology	LTR/Uvira	Bujumbura 02.04.96	Bujumbura 12.04.96
Kissaka, M.	Fish biology	LTR/Kigoma	Bujumbura 02.04.96	Kigoma 06.04.96
Zomba, P.	Fish biology	LTR/Mpulungu	Kigoma 02.04.96	Lagosa 11.04.96

ITINERARY ACCOMPLISHED: (including actual track chart)
Bujumbura – Mpulungu (see the track chart):
1) Start of the survey 02.04.96 from Bujumbura.
2) Sampling in the northern part of the lake, 02-06.04.
3) Arriving in Kigoma 06.04.96, 08.30, fuel bunkering, boarding of scientists.
4) Departure from Kigoma 07.04.96 at 14.00.
5) Sampling in the central part of the Lake 07-10.04.96.
6) Trawl stations no. 19-21, 09-10.04.1996, were carried out without echosounding.
7) Due to the severe problems it was decided to contact Bujumbura and in order to cancel the remaining stations of the cruise and return via Kigoma to Bujumbura.
8) In anchor outside Lagosa to disembark Ms. Paffen and Mr. Zomba on *M/V Mwongozo* 10.04 at 20.30 – 11.04. at 04.00.
9) Arrival in Kigoma 11.04.96 at 11.50, disembarking of scientists and unloading of samples to be analyzed at LTR/Kigoma.
10) Departure from Kigoma 11.04.96 at 18.15
11) Arrival in Bujumbura 12.04.96 at 05.00.
12) Off loading the scientific equipment and ending of the cruise.

SCIENTIFIC OR SURVEY ACCOMPLISHMENTS:
(with brief statements explaining failures to achieve objectives)

1) Hydroacoustics:
Bujumbura - Mpulungu

All the trawl hauls and planned transects up to station 18 were carried out and recorded. Results were stored on computer only from the haul no. 10 due to limited storing capacity of the computer (One hour recording takes 3 Mb). Therefore a tape streamer used only for hydroacoustics should be purchased. Since the Simrad software has been improved so that the echograms can be replayed afterwards even with changed settings, to purchase a tape streamer is one of the priorities. The echograms as printouts were recorded from the beginning of the cruise. The rest of the transects and trawls were cancelled due to malfunction of EY-500.

2) Trawl stations:
Bujumbura - Mpulungu

21 stations out of 33 stations were hauled. Due to malfunction of scientific echosounder EY500 the remaining 12 stations were cancelled and the survey was stopped.

3) Fish samples:
Bujumbura - Mpulungu

21 stations out of 33 were sampled. Catch rates were low and especially the catches of the last three stations conducted without EY500 echosouder were close to zero.

Mpulungu - Bujumbura

No samples were taken, but scientific crew was disembarked on the lake on M/V Mwongozo outside Lagosa and in Kigoma the following day.

A total 745 stomachs of the target species were collected during the cruise.

4) Plankton torpedoes:
Bujumbura - Mpulungu

Plankton torpedoes were attached to the trawl wing tips and the sampling conducted in a same way as during the previous H/A cruises. In total, 21 stations were sampled.

Mpulungu - Bujumbura

No stations were sampled (see above).

5) Plankton net stations:
Bujumbura - Mpulungu

Vertical plankton sampling was conducted at the following stations: stations 2, 5, 8, 12, 15, 18 and 19.

Mpulungu - Bujumbura

No stations were sampled (see above).

6) Water temperature measurements:
Bujumbura - Mpulungu

21 stations out of 33 (in the plan) were carried out. The remaining 12 stations were cancelled.

Mpulungu - Bujumbura

No stations were sampled (see above).

Due to the reparation of the CTD water temperature profiler the temperatures where taken with a Liinnos water sampler. At each station water temperatures were measured every 10 meters from surface down to 90 meters depth.

7) GULF V - larvae sampling:
Bujumbura - Mpulungu

14 stations out of 23 planned were sampled.

Mpulungu - Bujumbura

No stations were sampled (see above).

The sampler was attached to the starboard side trawl winch and towed in the same way (standardized wire length, time, towing speed) as during the previous cruises (see cruise report 02/95).

8) Meteorological station
Bujumbura - Mpulungu

The meteorological station was used from Kigoma up to the 21st trawling station.

PROBLEMS ENCOUNTERED. SUGGESTED IMPROVEMENTS. ETC.

Scientific equipment and sampling facilities

1) Hydro-acoustic equipment didn’t perform as expected. The echograms consisted of too much noise. This makes the post processing of the collected data unnecessary difficult. Therefore all sources of noise affecting the echosounder should

be covered and its level minimized. The new SIMRAD software was tried to install in the Compaq laptop computer, but was failed. This should be done soonest and absolutely before the next H/A cruise.

2) The trawl sonde didn't work and therefore the towing depth and the vertical opening of the trawl was estimated based on the experience of the previous cruises (e.g towing speed, warp length, etc.) and by using the Sonar ESR-150 aboard. It should be urgently fixed and tested. For the advanced data analysis it is one of the priorities.

3) Due to high frequency variation of power, the echosounder was burnt. It should be sent to SIMRAD Subsea A/S for repair before the next cruise (see below para. 12).

4) Calibration of the hydroacoustic equipment were done by Mr. Smith a few weeks before the cruise and the obtained settings were used through out the cruise in the echosounder. Due to a big difference of the two calibrations, one conducted in November 1995 and the latest one in March 1996, a third one should be carried out outside Bujuinbura well before the next cruise.

5) Racks for the CTD-sonde and plankton torpedoes should be manufactured and installed in the railing on the trawl deck. Some hooks to tie up additional sampling equipment should be welded in the railing frames on the trawl deck.

6) The marks of the wire for the hydrographic winch should be renewed before the next cruise.

7) The counter for the hydrographic winch didn't function and should be made functioning before the next cruise.

8) The software of the meteorological station on board didn't perform properly. At least two sensors, relative humidity and wind speed sensor didn't function and therefore should be replaced before the next cruise. Warranty for the meteorological station is still valid.

9) A stop-watch or a timer for larvae sampling (Gulf-V towing) should be purchased and written sampling instructions should be provided.

10) A 50 kgs spring balance should be purchased for weighing catch aboard.

General matters

11) High frequency radio ICOM-700 should be checked and should be replaced if necessary in order to allow communication between the vessel and all LTR stations without stopping all electrical equipment and the generator for communication.

12) The voltage and its frequency on board should be checked. Apparently, the variation of frequency caused a damage of the echosounder being the reason to cancel the remaining part of the

cruise.

13) Autopilot seemed to be working during the cruise, but being connected to the unadjusted compass the readings differed from the real vessel heading 30-40Q. It should be made fully operational.

14) Generally, since the second H/A cruise in June 1995 the performance of the vessel and the crew in the navigational and scientific point of view has greatly improved. Still to follow up the above mentioned matters would enable to reach a level of nearly 100% operation of the vessel during scientific sampling on the lake.

GCP/RAF/27l/FIN/TRAM/79

Report of Travel

to

Mpulungu (Zambia)
(arrival at 02.03.1996)

and

Lusaka (Zambia)

(11—13.03.1996 and 21—29.03.1996)

by

Victor Langenberg and Petra Paffen
APO — Fisheries Biologists

GCP/RAF/271/FIN.10

cc: Mann, TCO4
Kapetsky, FIRI
All LTR stations
Chrono
TRANS
Diary Langenberg
Diary Paffen
Diary: Hanek

1. INTRODUCTION

1.1 Objectives

The objectives of this travel were: (a) to change duty station from Bujuinbura, Burundi, to Mpulungu, Zambia, (b) to visit the FAO Representation in Lusaka, Zambia, and (c) to visit the Headquarters of the Fisheries Department of Zambia in Chilanga.

1.2 Itinerary

	Arrival	Departure
Bujumbura		28.03.1996
Mpulungu	02.03.1996	10.03.1996
Lusaka	11.03.1996	14.03.1996
Mpulungu	15.03.1996	20.03.1996
Lusaka	21.03.1996	30.03.1996

1.3Persons met

In Mpulungu

Mrs. Bosma	APO Fisheries Biologist, LTR/Mpulungu
Mr. Verburg	APO Fisheries Biologist, LTR/Mpulungu
Mr. Milindi	Research Officer, FD, LTR/Mpulungu
Mr. Makasa	Research Assistant, FD, LTR/Mpulungu
Mr. Mwenda	Research Assistant, FD, LTR/Mpulungu
Mr. Kaoma	Research Assistant, FD, LTR/Mpulungu
Mr. Chikoti	Technical Assistant, FD, LTR/Mpulungu
Mr. Kassikila	Captain R/V Silvershoal, FD, LTR/Mpulungu
Mrs. Banda	Secretary, FD, LTR/Mpulungu
Mrs. Sililo	Librarian, FD, LTR/Mpulungu
Mr. Chisambo	Driver, LTR/Mpulungu
Mr. Sikalumbi	Office Cleaner, LTR/Mpulungu
Mr. Mulota	Gardener, LTR/Mpulungu

+ other staff at LTR/Mpulungu

In Lusaka

Mr. G. Mburathi	FAO Representative
Mrs. N. Chisanga—Chibesakunda	Secretary
Mr. D. Fortes	Administrative Officer
Mrs. Agnes	Administrative Clerk
Mrs. R. Kaluba	Administrative Clerk
Mrs. A. Sililo	Registry Clerk
Mrs. F. Chibale	Receptionist
Mr. Phiri	Driver

In Chilanga

Mr. Mudenda	Director of the Fisheries Department

2. RESULTS

2.1 Arrival at LTR/Mpulungu

Mrs. Bosma introduced us to the staff of the Fisheries Department, explained station matters and helped us to get settled in Mpulungu. Mr. Milindi was very helpfull in organisational matters at LTR/Mpulungu. All staff of the Fisheries Department kindly explained their work and showed us

around. Especially Mr. Makasa, Mr. Muhenda, Messrs. Kaoma/Zulu and Mr. Lukwesa in charge of field and computer work for 3SF Hydrodynamics, Fish Biology, Zooplankton Biology and Limnology and Primary Production respectively. Mr. Chikoti was invaluable for his technical assistance. Mr. Chisambo skillfully arranged all other matters.

2.2 Visit to Lusaka

The FAD Representative kindly introduced to the representation and welco~ned us to ZairThia. All staff at the Represnetation helped us to arrange official papers. Especially Mr. Fortes, Mrs. Agnes, Mrs. Kaluba, Mrs. Chibale and Mr. Phiri were very helpfull. Unfortunately one of the FAD drivers was sick and the clearance of our goods and car had to be arranged by ourselves for the largest part. Our driver, Mr. Chisarnbo, AMI/Mpulungu and AMI/Lusaka were invaluable.

2.3 Visit to Chilanga

The Director of the Fisheries Department of Zambia kindly received.us and welcoxnrned us to Zambia. He was interested to visit the project again and assured us of his assistance when necessary. Unfortunately, the Officer in Charge at Research Division was on travel.

3. FOLLOW-UP

3.1 The SSP for fish biolgy should be changed according to the rules and data should he controlled on validity. (Action: Paffen, LTR/Mpulungu)

3.2 The SSP for limnology should used regularly calibrated equipment. (Action: Langenberg, LTR/Mpulungu)

3.3 During field trips for limnology and primary production, untrained persons not on BRA should not cooperate. (Action: Langenberg, LTR/Mpulungu)

3.4 The SSP for primary production should take better care to shield samples from sunlight. (Action: Langenberg, LTR/Mpulungu)

3.5 All available statistics information as collected by the Fisheries Department should be collected and computerized for SSP fisheries statistics. (Action: Paffen, LTR/Mpulungu)

3.6 Data bases for each 5SF component have to be created on harddiscs instead of on floppy discs. (Action: each component responsible, LTR/Mpulungu)

3.7 Computers should be cleaned of all unneccesary information or programs. (Action: Paffen and Langenherg, LTR/Mpulungu)

3.8 All missing data should be returned from privats or should be updated from the collective database at LTR/Kigoma. (Action: Craig, LTR/Kigoma)

3.9 The library has to be reorganized and computerized info has to he updated in PROCITE. (Action: Sililo, LTR/Mpulungu)

3.10 A telephone connection has to be established at the FAD Office. (Action: Langenberg, LTR/Mpulungu)

3.11 The offices have to be repaired at some places. (Action: Chikoti, LTR/Mpulungu)

3.12 The offices have to be repainted at some places. (Action: Sikaluinbi, LTR/Mpulungu)

3.13 The premises have to be cleaned and reorganized for storing old iron and other large items laying around. (Action: Mulota, LTR/Mpulungu)

3.14 Newsletters should be distributed directly to the persons on the list. (Action: Banda, LTR/Mpulungu)

RESEARCH FOR THE MANAGEMENT OF THE FISHERIES ON LAKE TANGANYIKA GCP/RAF/271/FIN

GCP/RAF/271/FIN/TRAM/8O

Report of Travel

to

Mpulungu, Zambia
(11 – 19.05. 1996)

by

J. F. CRAIG

Biostatistician

GCP/RAF/271/FIN.10

cc: Mann, TCO4
Kapetaky, FIRI
All LTR Stations
TRAMS
Diary: Craig

GCP/RAF/27 1/FIN **May 1996**

1. INTRODUCTION

1.1 Objectives

The objectives of the duty travel were to: (1) monitor the establishment and progress of the two transferred international staff, APOs Langenberg and Paffen, (2) assess the present state of the Mpulungu station and (3) exchange data as required.

1.2 Itinerary

	Arrival	Departure
Kigoma		11/05/96
Mpulungu	13/05/96	17/05/96
Kigoma	19/05/96	

1.3 Persons met

Mr V Langenberg	LTR
Ms P Paffen	LTR
Mr Mwape	DOF, Mpulungu Station
Mr Makassa	DOF, Mpulungu Station
Other personnel of	DOF, Mpulungu Station

2. RESULTS

2.1 Langenberg and Paffen

Unfortunately Mr Langenberg had been ill from malaria. He returned to work on the second afternoon of my visit. Both he and Ms Paffen have applied themselves enthusiastically and conscientiously to their new posting and the station is looking well organised. It is important that they interact with national staff in a considerate fashion and consult them on all actions undertaken (see Mpulungu station below).

I emphasised the importance of working on the aspects of limnology and fisheries statistics outlined in my memorandum on the final science report. I reminded the APOs that time was very limited and report writing was well behind schedule. I expected results that would prove Langenberg's and Paffen's abilities which they stressed they had.

2.2 Mpulungu station

I held a discussion with Mr Mwape. He complained that DOF staff in the past had just been used as samplers (technicians) and had not been fully involved with the SSP. Regular meetings between him, Mr Milindi and the international staff had discontinued over a year ago and policies which affected DOF were taken by the international staff without consultation with the Director. With new international staff this problem can now be rectified.

I warned Mr Mwape that the sampling programme would be severely cut back in the future which would affect his staff. Later that day, Tuesday, he also suffered from an attack of malaria and I did not see him again.

Research officers should be trained in practical sampling techniques so they can supervise field staff. They should also

be involved in report writing.

Research officers: Mr Mwape and Mr Milindi
Component leaders: Hydrodynamics – Mr. Makassa
Limnology – Mr. Luwessa/Mr Ngandu
zooplankton – Mr. Kaoma/Mr Zulu

Fish biology and statistics – Mr. Mwenda/ Mr. Chomba.

2.3 Data

Databases on computer hard disks for each component had not been established and data when available were stored on floppy disks. A considerable amount of data collected at Mpulungu is not available there. The present staff are developing these databases and identifying the missing data. I have a list of most of the latter and will send them to Mpulungu. National staff complained at the lack of availability of data and appeared to be unaware of where data were stored in the past.

I exchanged various data with the station.

2.4 Other matters

Mr Makassa discussed his manuscript on water currents with me and I have taken the document to edit and do some further statistical analysis. It will also be sent to Dr Plisnier for comment as he is one of the authors.

Mr Langenberg suggested that the running of the meteorological station at Mpulungu DOF should be discontinued. Mr Verburg to be consulted.

GCP/RAP/271/FIN/TRAM/81

Report of Travel

to

Kigoma (Tanzania)

(20—27. 05. 1996)

by

Pekka Kotilainen, Hydrologist

Timo Huttula, Sub-component leader in hydrodynamics

and

Matti Savinainen, Civil engineer

GCP/RAF/271/FIN.10

cc. Gonzalez-Alberdi/Mann, TCO4
Kapetsky, FIRI
Lindqvist/Mölsä, Kuopio
Huttula/Peltonen, Tampers
Savinainen, Joensuu
LTR, Kigoma
LTR, Mpulungu
Chrono, LTR, Bujumbura
Trams, LTR, Bujumbura
Diary: Kotilainen

1. INTRODUCTION

1.1 Objectives

The objectives of the duty travel were: 1) to take *R/V TANGANYIKA EXPLORER* on the dry dock (slip way) in Kigoma for welding a rail below her water line for the new equipment Acoustic Doppler Current Profiler (ADCP) used for hydrodynamics; 2) to test the new equipment outside Kigoma; 3) to install a gyro compass GY–700, ADCP and DGPS onboard, interface them and verify the functioning; 4) to replace two sensors of the ship meteorological station and test its functioning; 5) to test other equipment i.e. high frequency radio IC– 700, hydrographic winch counter and Robertson AP45 autopilot; 5) to meet LTR/Kigoma personnel to discuss about the data analysis and the future work plan and; 6) to verify the functioning of the wind station in Kigoma.

1.2 Itinerary

	Arrival	Departure
Bujumbura		20.05.96
Kigoma	21.05.96	26.05.96
Bujumbura	27.05.96	

1.3 Persons met

Dr. J.F. Craig, LTR/Kigoma
Mr. P.Mannini, LTR/Kigoma
Dr. K.Banister, Liaison Officer, UNO/RAF/007/GEF
The crew of *R/V TANGANYIKA EXPLORER*
Mr. Mubalaza, Branch Manager, TRC/Kigoma
Mr. Musimbushi, Chief Engineer, TRC/Kigoma
Mr. M. Abdullah, Manager of Hill Top Hotel, Kigoma
The personnel of TAFIRI/KIGOMA

2. RESULTS

2.1 Installation of the rail for ADCP

After our arrival by M/V Liemba in Kigoma all the equipment were removed to *R/V TANGANYIKA EXPLORER.* The instructions were given to start to weld the rail on the starboard side of the vessel for the ADCP. The Chief Engineer of *R/V TANGANYIKA EXPLORER,* Mr. Makere, was responsible for the follow-up of the work.

TRC personnel was contacted to make the arrangements to take *R/V TANGANYIKA EXPLORER* on the slip way.

In the discussions with the TRC personnel the following was noted:

There was already two other vessels on the slipway, but there still was space enough for *R/V TANGANYIKA EXPLORER* close

to the water line. Due to the two other boats only two wagons of 100 tons each were available for *R/V TANGANYIKA EXPLORER.* It was proposed and decided that extra supports will be welded and jacks be put to support the mid hull as soon as the vessel is off the water. due to 140 tons BRT of *R/V TANGANYIKA EXPLORER.* Because of the vshape the vessel hull some preparations for the wagons had to be made. The same supports were used on the wagons as were used when she was taken on the slipway in January 1995.

``The first trial to take *R/V TANGANYIKA EXPLORER* to the slipway was carried out on Wednesday afternoon 21.05.96. The pulling chain of one of the wagons was lost due to muddy bottom and it was decided to delay the dry docking until the next morning. Later the same day after consulted with the FIIT/FAO personnel through LTR Headquarters, Bujumbura, it was advised that the whole operation should be cancelled because of the delay and complexity of the work and only the welding of the rail above the water line was considered to be safe to be carried on in Kigoma. The rest of the work, underwater welding, if it was seen to be necessary, was decided to be finalized in Bujumbura.

2.2 Tests of the ADCP

While testing the ADCP it was noticed that it had been delivered with a wrong hardware setup. The manufacturer was contacted in the matter who promised to send the correct hardware board to Bujumbura as soon as possible. In the meantime, further instructions were given by the manufacturer to enable us to carry out the tests of the equipment.

2.3 Installation of other equipment

Gyro compass was taken to the TAFIRI/KIGOMA premisses for the test and was found to be working perfectly. On the way back to Bujumbura it was installed temporarily onboard and gave the same result. The interfacing with the autopilot was decided to be done later outside Bujumbura during the ADCP tests.

Ship meteorological station was lowered, the two malfunctioning sensors were replaced and all sensors were cleaned. The station seemed to be working correctly on the way back to Bujumbura apart from the minor software problem calculating the sun minutes.

The antenna tuner box of the high frequency radio ICOM-700 aboard was replaced closer to the antenna inside the hold of the mast headlight. The radio was tested during sailing and *R/V TANGANYIKA EXPLORER* was communicating to Lake Victoria near Kampala, Uganda, distance being approximately 600 km.

The counter of the hydrographic winch was tested and noticed that the pooling was incorrect. After changing it, the counter started working, but was decided to be tested with the CTD off Bujunibura.

2.4 Other tasks in Kigoma

A visit was paid to the Kigoma wind station due to the request of the landlord to replace the station. The new site that was pointed out by him was noticed to be even better than the present one and therefore we agreed on the reinstallation with Mr. Abdullah. He kindly promised to provide technical assistance in the reinstallation.

All the data that were available in hydrodynamics were put together with Dr. Craig to complete the compilation of all the LTR data in hydrodynamics up to 1995 December. It was decided that the data compilation for hydrodynamics will be finalized in Bujunibura.

A short discussion with Dr. Craig about the future work on hydrodynamics and sharing the responsibilities at each station was held. It was decided that the main responsibility in the field for the hydrodynamic sub-component will be in Bujunibura, but reporting and activities will be done at each station under supervision of the sub—component field coordinator and sub—component leader.

The ne equipment was presented to Dr. Banister, the Liaison Officer of UNDP/GEF project (UNO/RAF/007/GEF) 'Pollution control and Other Measures to Protect Biodiversity of Lake Tanganyika'.

3. CONCLUSIONS AND FOLLOW-UP

The rail for the ADCP was welded and painted on 23—24.05 and attached to the side of the vessel on 25.05.96, during the weekend. It seems that the equipment, although being very sensible for resonance, works well with the present installation. Still, whenever the vessel will be taken to the slipway a support for the rail below the water line should be welded to minimize the risk of damage of the ADCP due to resonance.

The ADCP was tested on the way back to Bujuxnbura by following the given instructions and was found to be working.

Due to the extremely tight schedule all manufacturers couldn't reach the deadlines to enable to complete the tests with the fully interfaced equipment.

The data compilation was seen to be very important to meet the deadlines stated before for reporting. Due to some new activities (i.e. ADCP and RDI workhorses) the reporting in hydrodynamics should be carried out as it has been planned earlier.

3.1 Replacement of communication board of the ADCP (Action: LTR/Bujumbura)

3.2 Tests for the DGPS and interfacing the equipment (Action: LTR/Bujumbura)

3.3 A test cruise of the equipment in mid-June 1996 (Action: LTR/Bujumbura)

3.4 Reinstallation of the Kigoma wind station (Action: LTR/Bujumbura, LTR/Kigoma)

3.5 The permanent installation of the Gyro compass GY—700 and the interfacing with autopilot (Action: Savinainen, Constructor).

3.6 The test of the high frequency radio ICOM-700 (Action: Savinainen)

3.7 Data compilation for hydrodynamics (Action: LTR/Bujumbura)

GCP/RAF/271/FIN/TRAM/82

Report of Travel

to

**Kigoma (Tanzania)
(03.11.95 – 03.01.96)**

by

K. Hyvönen

from

Department of applied zoology and veterinary sciences

GCP/RAF/271/FIN.10

cc. Mann, TCO4
Kapetsky, FIRI
Everett
Turner
Lindqvist/Mölsä, Kuopio
Huttula/Peltonen, Tampere
Savinainen, Joensuu
FAOR-Bujumbura
LTR, Kigoma
LTR, Mpulungu
Chrono
TRAM

1. INTRODUCTION

1.1. Objective

The objective of this trip to the LTR station in Kigoma was to put into effect the laboratory rearing experiments for estimating the development time of calanoid copepod *Tropodiaptomus simplex* and some cyclopoid copepod species in Lake Tanganyika. The results will be used for the estimation of copepod production in Lake Tanganyika as a part of lake fish productivity assessments. In this report, the principles of the methods used are described, and the outcomes of the experiments are discussed.

1.2 Itinerary

	Arrival	Departure
Kuopio		03.11.95
Helsinki	03.11.95	04.11.95
Brussels	04.11.95	05.11.95
Bujumbura	05.11.95	06.11.95
Kigoma	07.11.95	29.12.95
Uvira	30.12.95	30.12.95
Bujumbura	30.12.95	02.01.96
Brussels	03.01.96	03.01.96
Helsinki	03.01.96	03.01.96
Kuopio	03.01.96	

2. ACTIVITIES AND OUTCOMES

2.1 Laboratory rearing experiments

2.1.1 Collection of zooplankton

The animals were collected with a 100 µm mesh plankton net with a single haul from the 100m depth to the surface. The zooplankton were transferred to lakewater which was taken from a depth of 20 m with a 7.4 1 Limnos sampler. The zooplankton samples were then transported to the laboratory and acclimatised for approximately 24 -48 hours at room temperature (23~28°C).

2.1.2 Egg-development times

After the acclimatisation period, the surviving adult female zooplankton with eggs were picked out and isolated individually in flat-bottomed petri-dishes with about 10 ml of lakewater previously filtered through phytoplankton net, mesh-size 25µm, to exclude all the zooplankton and large clumps of blue-green algae. The females with eggs were then kept at room temperature under normal light conditions and observed under the low-power of a stereo microscope every 2 hrs from 0700 - 2400 hours. The

females carrying eggs were recorded and counted. The numbers of egg carrying females will be plotted against the number of hours from the start of the experiment. The regression between the numbers and time will be calculated to determine the point of intersection with the time axis and thus the mean development time of the eggs (Burgis 1970).

2.1.3 Post-embryonic development

To study the development times, the zooplankton females with eggs were isolated on petridishes, 3 females to each dish. The females were kept at room temperature until the nauplii had hatched. The nauplii hatched about the same time and were transferred to culture bottles with 25 ml of filtered lakewater. The water in culture bottles was changed daily and the nauplii or copepodids were fed only with natural lake water. The water was collected daily from the lake from the depth of 20 metres with a 7.4 l Limnos sampler and filtered through a 25 µm mesh plankton net. Phytoplankton concentrations (measured as fluoresence of chlorophyll *a)* were measured daily using a fluorometer calibrated previously.

The nauplii or copepodid stages in culture bottles were settled on the table during the day and kept in a water-bath during the night to avoid the changes in ambient temperature. Controlling the ambient air by setting the culture bottles in a water-bath did not always succeed, and during the warmest season, the water temperature even rose to 30°C. The culture bottles were then kept on the table during the day and with fans the temperature was kept at 28cC maximum. During the night, the culture bottles were set in the water-bath to keep the temperature higher than in the ambient air.

The nauplii were observed daily against light in the culture bottles. The transition from the nauplii to the copepodid stage was observed when the larvaes' appearance and mode of swimming had changed. The adult stage was recocnized from appearance of genital segment in females and from the change in structure of the first antenna in males. The development time of nauplii changed from *5* to 11 days. The calanoid males reached their adult stage from 26 to 31 days and females from 31 to 36 days under the above laboratory conditions.

The first group of nauplii that were settled in special cultivation bottles in a volume of 25 ml of water died, perhaps because of the lack of oxygen or food, or because of a too high ambient temperature. The cultivation method was changed because of the too high mortality among the nauplii. The nauplii were then cultivated in flasks with volumes from 50 ml up to 250 ml. The cyclopoids did not manage well at all. They were able to reach the naupliar stages only, and never lived long enough to reach the copepodid stages.

After the calanoids had reached the copepodid stage, they were fed with extra food. The phytoplankton for extra feeding was collected by pulling a 25 µm plankton net with a motorboat, very slowly for ten minutes. The collected phytoplankton was then diluted in a greater amount of water taken with the Limnos sampler from the depth of 20 m and filtered through the 50 µm plankton net in the laboratory. This allowed some extra naupliar stages to pass through to the cultivation flasks, and was thus not an approriate way for feeding the nauphar stages.

2.2 Determination of individual carbon and nitrogen contents of Lake Tanganyika zooplankton

The zooplankton was collected with 100 µm and 50 µm mesh sized plankton nets with a single haul from the 100 m depth to the surface. The zooplankton were transferred to lakewater taken from the 20 m depth with a 7.4 l Limnos sampler. Animals were brought to the laboratory alive. Because some problems arose in identifying the animals against a white background, the animals were first selected alive using a black background. They were collected with a pasteur-pipette. Living animals were grouped with calanoids and cyclopoids. They were then grouped as males, females, females with eggs and the copepodid and naupliar stages.

The selected males, females, the females with eggs and copepodid stages were then filtered on glass fibre filter. Immediately after the water had passed through the filter, the vacuum was cut off. The filter was placed on a small drop of water on a petri-dish. The filter was kept moist in order to cover the animals' water film, but not to allow them to move. Animals were selected and put into precombusted aluminium-foil cups with watchmakers forceps. The naupliar stages were collected with a pasteur pipette with a minimum amount of water, because the watchmakers forceps were too big for that purpose. Then they were transported to aluminium-foil cups as mentioned. Next the aluminium-foil cups were put on tissue-culture multi-well plates and dried in an oven at ca. 60°C. Background cups were also collected. The following numbers of animals were put in each cup: males 5 specimens

females 5 specimens

females with eggs 5 specimens

copepodid stages 10 specimens

naupliar stages of calanois 30 specimens

naupliar stages of cyclopoids 40 specimens

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2.3 Conclusions and recommendations

This experiment should be regarded as preliminary because some of the laboratory conditions were not fully controlled. The method for controlling the temperature should be developed for future experiments, because the temperature varied up to 8cC maximum during the experiment. This would be a very important source of error, especially for egg-development time experiments, as the development times of copepod and cladocerans eggs appear to be wholly dependent on temperature (Bottrel *et al*., 1976; Vijverberg, 1980). In another experiment concerning egg-development time of Lake Malawi zooplankton, the temperature range was 3°C and in post-embryonic development studies even up to 11°C (Irvine and Waya 1995). Thus the results obtained now, are comparable in terms of tempratures, and can be used in rough production calculations.

The development time can also be dependent on food concentration. For example, in an experiment by Santer and van den Bosch (1994) on naupliar *(Cyclops vicinus),* the development time decreased from 40 days to 28 days with increased food. Also, the complete development time, from the first naupliar stage to the adult stage, was reduced to almost half of the initial by increasing the amount of food (from 64 days to 31 days, male; from 67.5 days to 35 days, female). The carbon content of algae was determined by combustion and IR measurement of CO_2.

The reason for the high mortality in cyclops could have been the unsuitable diet. For example according to Santer and van den Bosch (1994) for *Cyclops vicinus,* only the flagellate algae were sufficient food for newborn nauplii. The newborn nauplii died after a few days on the diet of the chlorococcale algae *M. minitum* or *S. acutus* or the diatom *C. meneghiniana.* They reached only the second naupliar stages. Nauplii also seemed to be more sensitive to low food concentrations than the copepodites. For example food densities <0.4 mg C^{-1} of *C. reinhardii* were not sufficient to cover the food requirements of the early naupliar stages. Newborn nauplii feeding on food densities <0.4 mg C^{-1} reached the second instars stage, but died after a few days. The same methods, already mentioned, were also applied in the current experiment (to determine the carbon content).

Nauplii need a much higher food concentration for development than copepodites. Their low ingestion rates indicate that low feeding efficiency can be a reason for their food demand. The first two naupliar stages might be more sensitive to food shortage than the later instar stages. It has also been reported by Soto and Hulbert that under conditions of food scarcity *Acanthocyclops* nauplii had a lower survival rate than Diaptomus nauplii (Santer and van den Bosch 1994). That could explain the lower survival rate in cyclops than in calanoids in laboratory rearing experiments in Lake Tanganyika.

If it were necessary to supply extra food for naupliar stages, it would be ideal to use a 20 µm mesh plankton net to collect the appropriate sized phytoplankton. The coarser, *25µ*m mesh plankton net is needed to exclude the other naupliar stages.

The results indicate the development time of calanoids in given conditions. In different conditions, especially at better controlled temperatures, the development time could also differ. The egg-development time compared to post-embryonic development should confirm, however, the reliability of the results. The technical problems met during the experiments help the planning of the future trials. After evaluating the final results of the present study, one should decide whether further experiments are required in order to achieve the objectives in final production assessments. If some complementary experiments are to be done with calanoids, special attention should be paid to the duration of the culture experiment, the temperature control without continuous supply of electricity, and the suitability of the phytoplankton diet. All the possible reasons for the mortality in test desing or handling the animals should be avoided. Although the studies on the cyclopoid development times could not be completed in a sufficient way, no complementary experiments will be proposed in 1996, and the final estimations will be based on the obtained results or partly on literature.

The final results and the conclusions of the current experiments will be reported separetely.

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GCP/RAF/271/FIN/TRAM/83

Report of Travel to Kuopio, Finland and Brussels, Belgium (2–11.6.1996)

by

**George Hanek
LTR Coordinator**

GCP/RAF/271/FIN.10

cc: Mann, TCO4
Kapetsky, FIRI
Everett, FIPP
Ssentongo, FIPL
Turner/Smith, FIIT
FAOR - BDI
Lindqvist/Mölsä/Huttu1a, LTR/Kuopio & Tampere
All LTR Stations
Chrono
Diary: Hanek

1. INTRODUCTION

1.1 Objective

The objectives of this duty travel were: (1) to take part in the conferment ceremonies at the University of Kuopio; and (2) to meet with LTR personnel in Finland and (3) to meet with ex—LTR staff in Brussels.

1.2 Itinerary

	Arrival	Departure
Bujumbura		2.6.1996
Kuopio	5.6.1996	9.6.1996
Brussels	9.6.1996	11.6.1996
Bujumbura	11.6.1996	

1.3 Persons met

in Kuopio

Prof. O.V. Lindqvist	LTR Scientific Coordinator
Dr. Hannu Mölsä	LTR Deputy Scientific Coordinator
Dr. Timo Huttula	LTR Hydrodynamics leader
Ms. Annu Peltonen	LTR Scientist (Hydrodynamics)
Mr. Voitto Tuomainen	LTR Scientist (Remote sensing)

in Brussels

Messrs. Coenen and Plisnier ex—LTR staff members

2. RESULTS

2.1 Meetings in Kuopio

I took part in conferment ceremonies at the University of Kuopio. Apart from these very formal but enjoyable functions (for details see LTR Newsletter No. 18) I have had numerous meetings with our Finnish colleagues, all devoted to project matters, which are now summarized as follows:

* all are disappointed with the results or better no—results of the LTR Evaluation Mission since the expected output *i.e.* funding to cover LTR's second phase just did not happen (FIM 3,000,000 were promised well before Evaluation Mission took place); it was explained that budgetary limitations under GCP/RAF/FIN/271 cause many problems in the field (resultingly the contracts of two GS's in Bujumbura were not extended and extension of contracts of international staff is also uncertain). It was agreed that in order to ensure the normal operation of LTR all effort must be made to (1) recuperate' all costs incurred under GCP/RAF/271/FIN on hydrodynamics equipment, (2) seek the permission to use some funds from recently received FIM 3,000,000 during 1996 (3) seek supplementary funding from other donors and

on the basis of the above (4) decide during 5th Joint Meeting of LTR Committees the duration of LTR's 'extension phase';

* all are similarly disappointed with the slow 'reactions' by TCO4, TCOX/P and particularly by AFSP (Peled & Co.), specifically those dealing with numerous matters re: InterAgency Agreement (UNOPS/FAO); there are considerable delays in processing the various equipment purchases (computer work station was still not ordered and is urgently needed) although Dr. Huttula and his team provided all details to FAO HQ in December 1995. Aftereffects of reorganization at FAO HQ were explained; nevertheless, Prof. Lindqvist insisted on improvement and faster dealing with administrative matters since the terms of InterAgengy Agreement are very demanding (he will call Mr. Mann on this subject);

* the 'problem' areas i.e. remote sensing and analysis of acoustics data were also dealt with. While the previous problems with remote sensing were already resolved (Mr. Tuomainen is busy finalizing the final report) there are still problems with the processing of acoustics data and finalizing the cruise schedule in this component. It was agreed that one last effort will be made to ensure Mr. Aro's services and, if he can not guarantee what LTR needs in this area, other person will have to be recruited immediately so that required biomass results are available for September meeting;

* concerns were raised re: distribution of project data, future of LTR's Documentation Centre, etc. It was explained that all effort are being made to ensure the security of data, particularly those at LTR/Bujumbura; streamer is used weekly to copy all data, including project's administrative and financial records so that these are protected in case of evacuation. Similarly, all expensive equipment, particularly that purchased under InterAgency Agreement, is stored aboard *R/V Tanganyika Explorer.* Consequently, the only problem (in case the evacuation takes place) is to ensure the security of our Documentation Centre (while all references are on the streamer the hard copies are just too bulky). In any case it was agreed that all LTR raw and analysed data will be copied to the University of Kuopio and other LTR Finnish scientists and, if possible, the entire LTR Documentation Centre will be transferred to Univ. of Kuopio at the end.

2.2 Meeting with Messrs. Coenen and Plisnier

A very enjoyable meeting was held in Louvain with both ex-LTR's staff. Both are still interested in LTR, specifically:

* Eric is still interested in 5-VI-BDI—102 (Renforcement de l'Unité de statistiques de pêche) and, providing funding situation is resolved, to 'synthesize' the results of 1995 simultaneous frame survey; and

* Pierre—Denis is still working, under Author's Contract, on two Technical Documents but, in order to finalize them, requires some meteo data. This was specified and action already taken. He is also interested to translate his three Technical Documents to

French; he was requested to make a proposal to this effect.

3. CONCLUSIONS AZID FOLLOW-UP

3.1 Propose budgetary revision of GCP/RAF/271/FIN 'recovering' the cost of equipment purchased for hydrodynamics component (Action: Mr. Mann and LTR Coordinator).

3.2 Seek permission to use some FINNIDA funds originally granted for LTR extension (1997–8) during 1996 (Action: Mr. Mann).

3.3 Seek supplementary funding for LTR extension (Action: Mr. Mann, TCDM, Prof. Lindqvist).

3.4 Decide the LTR duration (Action: 5th Joint Meeting of LTR Committees)

3.5 Speed–up administrative actions re: InterAgency Agreement (Actions:
equipment: AFSP; recruitment of Mr. Barandemaje: TCOX/P and general:
TCO4).

3.6 Resolve problem re: analysis of LTR acoustics data (Action: Dr. Mölsä and if not satisfactory Smith/Venema, FlIT)

3.7 Assure regular distribution of LTR data to all concerned (Action: Dr. Craig)

3.9 Seek decision on eventual location of LTR Documentation Centre (Action: 5th Joint Meeting of LTR Committees).

3.9 Consider Eric Coenen for 5–VI–BDI–102 (Action: Mr. Mann, TCO4 and Mr. Stamatopoulos, FIDI)

3.10 Propose Author's Contract to Coenen re: synthesis of 1995 simultaneous frame survey (Action: LTR Coordinator).

3.11 Locate and copy required meteo data to Plisnier (Action: Messrs. Kotilainen and Verburg).

3.12 Propose translation of three Technical Documents to French (Action: Mr. Plisnier)

GCP/RAF/271/FIN/TRAM/84

Report of Travel

to

Kigoma (Tanzania)

and

Mpulungu (Zambia)

(17—25. 06. 1996)

by

Pekka Kotilainen
Expert in Hydrodynamics

GCP/RAF/271/FIN.10

cc. Mann, FIO
Everett, FIPP
Kapetsky, FIRI
Lindqvist/Mölsä, Kuopio
Huttula/Peltonen, Tampere
LTR, Kigoma
LTR, Mpulungu
Chrono, LTR, Bujumbura
Trains, LTR, Bujumbura
Diary: Kotilainen

1. INTRODUCTION

1.1 Objectives

The objectives of the duty travel were: (1) to test the ADCP (Acoustic Doppler Current Profiler); (2) to introduce the research vessel *R/V TANGANYIKA EXPLORER* to the Ambassador of Finland in Zambia, a.i., FAO Representative in Zambia and to the Zambian authorities in Fisheries in Mpulungu; (3) to test other additional equipment aboard; (4) to verify the meteorological stations around the lake and at the two LTR lake stations and; (5) to train the personnel in Mpulungu and Kigoma on data analysis in hydrodynamics.

1.2 Itinerary

	Arrival	Departure
Bujumbura		17.06.96
Kigoma	18.06.96	18.06.96
Mpulungu	19.06.96	22.06.96
Kigoma	24.06.96	24.06.96
Bujumbura	25.06.96	

1.3 Persons met in Kigoma

Dr. Menz, GEF, Coordinator
Dr. Banister, GEF, Liaison Officer
Mr. Mannini, LTR, Kigoma
Mr. Verburg, LTR, Kigoma
Ms. Bosina, LTR, Kigoma
Mr. Katonda, TAFIRI, Kigoma
Mr. Chitamwebwa, TAFIRI, Kigoma
Mr. Kissaka, TAFIRI, Kigoma
Mr. Chatta, TAFIRI, Kigoma

in Mpulungu

Mr. Ikonen, Chargé d'Affaires, Embassy of Finland in Zambia
Mr. Mburathi, FAO Representative in Zambia
Mr. Katundu, Chief Fisheries Research Officer, DOF, Zambia
Mr. Chilimunda Chief Fisheries Training Officer, DOF, Zambia
and several officers of DOF, Mpulungu, Zambia

2. RESULTS

2.1 Mission on the Lake. 17–19.06 and 22–25.06.96

During the first part of the cruise CTD-sonde, STD-12, and EY500 Echo sounder were tested but only the function of the echo sounder was verified. Due to the tight schedule the visit in Kigoma remained very short, only 2 hours. At the time a quick briefing session was held with Mr. Verburg and some data analysis was requested for him to do. Some instruments were handed over for the sampling in LTR/Kigoma. Also a visit was

paid for the Lake Meteo Station off Mpulungu. It was unloaded and some sensors were removed for the tests to be conducted in Mpulungu.

During the second part of the survey the Lake Meteo Station off Mpulungu was again visited. Additional tests were carried out with it's sensors on board R/V TANGANYIKA EXPLORER. The sensors that were giving wrong readings when attached the buoy were working perfectly on board.

After the departure from the station the Acoustic Doppler Current Profiler was tested. A transect of 5 hours across the southern part of the lake was made during the evening and the following night. The ADCP was interfaced to the Gyro compass as well as to the vessel's GPS and it seemed to be working perfectly. Due to the time limits and lack of personnel the new DGPS (Differential Global Positioning System) was not tested; the differential station of the equipment is a removable land-based station and cannot be left unattended. The test was decided to be carried out in Bujumbura.

On the way to Kigoma the Lake Meteo station off Kigoma was visited and unloaded. It was found to be working perfectly.

R/V TANGANYIKA EXPLORER visited Kigoma again on the way to Bujumbura. This time a longer discussions with Verburg were held and hydrodynamic data from different stations were handed over to be analyzed. Also some analyzed data were received. The water level station was unloaded and updated. It seemed to be working perfectly. The coordinator of UNTS/RAF/007/GEF visited R/V TANGANYIKA EXPLORER and she and the first results of the ADCP were introduced to him.

Because of the time limits the wind station of Kigoma was not visited, but the follow—up remained on Verburg's responsibility.

The morning of arrival in Bujumbura one trawl haul was made to test the scientific echosounder after repair. It is was noticed that when it is branched to a UPS the noise level is considerably lower than before. The equipment was working well.

2.2 Visit to Mpulungu

Shortly after the arrival of *R/V TANGANYIKA EXPLORER* in Mpulungu four visitors, Messrs. Ikonen, Mburathi, Chilimundu and Katundu two of them, Messrs. Ikonen and Mburathi stayed on board

GCP/RAF/271/FIN/TRAM/85

Report of Travel

to

FAO Headquarters, Rome, Italy

(11–14.6.1996)

by

J. F. CRAIG
Biostatistician

GCP/RAF/271/FIN.10

cc: Mann, TC04
Hanek, LTR/Bujumbura
Kapetaky, FIRI
Everett, FIPP
TRAM
Chrono
Diary: Craig

1. INTRODUCTION

1.1 Objectives

The objectives of the duty travel were to: (1) brief Mr Mann and Dr Kapetsky on the current position of the scientific results and the production of the final report; (2) discuss contract extensions and working conditions in Kigoma; (3) obtain literature from the library; and (4) attend to administrative matters.

1.2 Itinerary

	Arrival	Devarture
Dunscore/Edinburgh		11/06/96
Rome	11/06/96	14/06/96
Dunscore/ Edinburgh	14/06/96	

1.3 Persons met

Mr M J Mann
Dr J M Kapetsky
Ms S McNaughton
Ms J Collins
Mr J Turner
Mr A Smith

2. RESULTS

2.1 Scientific results and the final report

I gave some of my views concerning the overall project to Mr Mann and Dr Kapetaky. During the scientific sampling programme a very significant amount of unique data had been collected. Some time would be taken in making use of these data i.e. analysis, interpretation and application. However data from fixed stations had their limitations. The research vessel became operational rather late in the programme. I also felt that the field staff, many of whom are inexperienced in relation to the tasks expected of them, are spread very thinly and have been working in isolation without the guidance and help they require in the synthesis of the data. There has been insufficient feedback, communication and involvement from some of the scientific component leaders. Time consuming administrative duties are also imposed on some of the field staff.

Dr Kapetsky expressed what he saw as being the essential results from the project: How much is being caught, how and by whom? How much is there to be caught and how does this vary in time and space? How much should be caught and by what methods. On reflection and on examination of the original project document, I do not agree that these are the aims of the present phase. Under section: ‘B.2 Expected end of project situation and sustainability of project results’, it is stated that ‘At the conclusion of the present project there should be a more confident understanding by fisheries scientists of the biological basis of fish production in Lake Tanganyika, and hence their capacity to forecast on both a seasonal and annual

basis the stock abundance of the main pelagic fish'. I think the results of the first phase of the project will be an understanding of the basic ecosystem of Lake Tanganyika with which a management plan for the pelagic fisheries can be based. The degree of forecasting of fish abundance will probably be very limited.

I outlined the present situation regarding data collection, compilation and analysis and the writing of reports. I reminded them of the memorandum I had circulated (1 March 1996) which suggested a format for the final scientific report, detailed the component manuscripts that were required for this report and gave deadlines for the production of the manuscripts. Few if any of the deadlines had been met. The causes for this should be determined and used in future planning and staffing of a project, in particular the requirements for undertaking an extensive, ambitious, research programme spread over a large area. Dr Kapetsky recommended that I expanded in detail on the proposed outline of the report. This I would do on my return to Kigoma. Dr Kapetsky would indicate to all involved in the project the importance of producing results and component reports in a timely fashion. I suggested that as scientific field coordinator I should meet with the Finnish based scientists involved in the project to discuss the preparation of the scientific final report. This view was not shared by Dr Kapetsky who thought the necessary contacts could be made in Kigoma during the meetings in September.

I indicated how important it was to obtain information on fish abundance and distribution as collected by acoustic and trawl surveys. These data have not been analysed. Discussions were held with Mr Smith and Mr Turner. It was suggested that if Mr Aro was unable to do this work then it should be sent out to an external consultant under an author's contract. Further work on calibration was first required as well as gathering the data together. Dr Kapetsky agreed to write a memorandum on this matter.

2.2 Contracts

I discussed with Mr Mann the present and future situation regarding the budget and the extension of my and Mr Mannini's contracts. I was not able to obtain a clear answer about the future. I stressed to Mr Mann and Dr Kapetsky that I had been asked in January 1996 to extend my contract for 6 months, to December 1996, and was pressed to make a commitment by the end of February (Hanek TRAM/73).

I suggested to Dr Kapetsky that if there was a necessity to analyse and report on specific data after the production of the final report, I was willing to do this early next year under an author's contract.

2.3 Library

I discussed the project with Ms Collins, scanned some recent literature and requested copies of papers to be sent to Kigoma.

2.4 Administration

This included extension of my Laissez—Passer and discussions with Ms McNaughton on entitlements and other related matters.

GCP/RAF/271/FIN/TRAM/86

Report of Travel

to

**Kigoma (Tanzania)
(26.10. – 08.11.1996)**

by

**Victor Langenberg and Petra Paffen
APO - Fisheries Biologists**

GCP/RAF/271/FIN.10

cc: Mann, TC04
Kapetsky, FIRI
All LTR stations
Chrono
TRAMS
chrono
Diary: Langenberg
Diary: Paffen

1 INTRODUCTION

1.1 Objectives

The objectives of this travel were (a) to attend a staff meeting of LTR/Kigoma and Mpulungu in which a proposal for a long-term Monitoring Programme which should provide the necessary indicators of lake productivity was drafted and (b) to discuss our respective Technical Documents in preparation with the Scientific Field Coordinator.

1.2 Itinerary

	Arrival	Departure
Mpulungu		26.10.1996
Kigoma	28.10.1996	06.11.1996
Mpulungu	08.11.1996	

1.3 Persons met

Dr. J.F. Craig	LTR Scientific Field Coordinator
Mr. P. Mannini	LTR's Field Coordinator Fish Biologist
Ms. E. Bosma	LTR's Field Coordinator Zooplankton Biology
Mr. P. Verburg	LTRs Field Coordinator Hydrodynamics
TAFIRI staff	

2 RESULTS

A draft proposal for a long–term Monitoring Programme was designed. This proposal was send to LTR/Bujumbura for revision by the Project Coordinator.

The continuation of LTR was discussed. The field staff of LTR/Kigoma and Mpulungu has agreed that more frequent meetings of a scientific nature are necessary to present, discuss and inter–link results of the Scientific Components of the Research. It was therefore proposed to arrange seminars of the Scientific Field Staff three times a year.

Paffen's Technical Documents on Fisheries Statistics in preparations was discussed with the Scientific Coordinator and the Field Coordinator for Fish Biology. Langenbergs Technical Document on Limnology was discussed with the Scientific Coordinator and revised for publication.

3 FOLLOW-UP

Arrangements for three meetings with seminars by the Field Staff in 1997. During these meetings the results of the Scientific Components of the research will be presented and discussed.
(Action: Hanek, LTR/Bujumbura).

GCP/RAF/271/FIN/TRAM/87

Report of Travel to Rome, Italy (14–24.8 and 23–27.9.1996) and to Dar es Salaam, Tanzania (29.9–2.10.1996)

by

**George Hanek
LTR Coordinator**

GCP/RAF/271/FIN.10

cc: Mann, TCO4
Kapetsky, FIRI
Everett, FIPP
Turner/Smith, FIIT
All LTR Stations
Chrono
Diary:Hanek

1. INTRODUCTION

1.1 Objective

The objective of this duty travel was to visit FAO Headquarters and deal with project's technical and operational matters.

1.2 Itinerary

	Arrival	Departure
Addis Ababa *		14.8.1996
Rome	14.8.1996	24.8.1996
Geneva**	24.8.1996	21.9.1996
Rome	21.9.1996	27.9.1996
Dar—es—salaam	29.9.1996	2.10.1996
Bujumbura	3.10.1996	

NOTE: * called to Rome since not able to return to duty station

** left on Sick Leave

1.3 Persons met

in Rome

Dr. Y. Kato	Director, FIP
Mr. M. Mann	0-i-C, TCO4
Dr. J. Kapetsky	SFRO, FIRI
Mr. G.V. Everett	SFPO, FIP
Mr. J. Turner	SF10, FlIT
Prof. O.V Lindqvist	Univ. of Kuopio
Dr. H. Mölsä	Univ. of Kuopio
Mr. M. Laamanen	Ministry of Foreign Affairs
Mr. S. Kuikka	Ministry of Foreign Affairs
administrative staff	
Chief Medical Officer	

in Dar es Salaam

Mr. T.W. Maembe	Director of Fisheries
Mr. P. Alleyne	FAO Representative
Mr. J. Yonazi	FAO Programme Officer

2. RESULTS

2.1 Preamble

As it was not possible to return to the duty station (reason: embargo declared against Burundi) I was instructed to go to Rome. There, many project's outstanding matters (both technical and operational) were treated and resolved. In addition, detailed work programme for all LTR stations was prepared and forwarded to all. Consequently and in order to save the project's funds, I have requested examination by the FAO Medical Officer; it was carried out and agreed that I should proceed undertake the long overdue medical treatment without any further delay. I have left Rome for Lausanne and, after competing the

treatment, returned to Rome on 21.9.1996.

2.2 LTR Joint Review

Was held in Rome from 23 to 24 September. It was based on the findings and recommendations of the appraisal study carried out by Mr. S. Kuikka, consultant to the Finnish Ministry of Foreign Affairs. Taking part were:
Messrs. Laamanen and Kuikka, Profs. Lindqvist and Mölsä, University of Kuopio, FAO HQ based technical and operational officers and the LTR Coordinator. This series of very successful meetings resulted in a 'Proposal for Extension and Budget Revision' which is now attached as Appendix 1.

2.3 In Dar es Salaam

As it was not possible to return to Bujumbura on WFP plane on 29.9.1996 (reason: the plane was full) I immediately proceeded to Dar es Salaam. There a series of meetings were held in order to secure the Government's of URT permission for *R/V Tanganyika Explorer* to sail to Kigoma. It was received.

Appendix 1

PROPOSAL FOR EXTENSION AND BUDGET REVISION

GCP/RAF/271 FIN: Research for the Management of the Fisheries on Lake Tanganyika.

1. The general conclusions at the joint review meeting in Rome 23-24 September were that the research programme implemented by the project to date had yielded considerable new data and knowledge regarding the hydrobiology and fisheries of the lake, but that the fisheries and the environment are normal and no immediate risks for collapse of the fisheries had been identified. Nevertheless, the full analysis and interpretation of the unique data already collected needs to be completed in order to serve the next level of operation which must provide practical results for the management of the shared fish stocks and related fisheries.

2. A management system based on estimates of biological production and on the establishment of optimum Total Allowable Catches (TACs) or *quotas,* was regarded as inappropriate to either the characteristics of the stocks concerned, or to the present socio—economic conditions at the lake, Therefore a more simple, cheaper, monitoring system to warn of major risks was recommended.

3. considerable additional work still needs to be undertaken with the assistance of the project in order to:

— consolidate the analysis of the data collected so far;

- transfer and communicate the relevant information to the government authorities and fisher—people concerned;

— prepare an initial lake—wide fisheries management plan, which must take into account the ownership and sustainability of the resources, as well as the socio—economic situation (about which insufficient is known, and of which women’s contribution to development is an integral component) so as to guide and not stifle private sector development initiatives;

- define a simple regular precautionary monitoring system for the future, capable of indicating the general trends in the fisheries and identifying whether any risks of instability

are appearing. Such a monitoring system should provide a ready index of the status of the stocks: acoustic estimates of biomass should also be used in the immediate future but catch–per–unit–effort (CPUE) data derived from regular statistical records was probably the most appropriate in the longer term, although the best units and techniques of measurement remain to be defined.

4. The recent FAO reports by Mr Cacaud and Mr Maembe presented various institutional options for inter-government discussions and harmonized action on fisheries management which would be considered at the forthcoming CIFA Sub-Committee meeting, in conjunction with the LTR project's Steering and Coordination Committee meeting.

5. In summary there needs to be an extension phase of the current project with the following outputs and activities, responding to the original project immediate objectives No.2 - Plan for management of the fisheries, and No. 3 – Establishment of uniform methods for long– term data collection:

output 1. A series of supplementary reports on the hydrodynamics limnology and fisheries biology.

Activity 1.1. complete the analysis of the scientific data collected during 1993–96;

Output 2. Reports on the analysis of the CPUE data from the four frame– surveys plus the related acoustic survey data.

Activity 2.1. Analyse collected CPUE data and recommend minimum monitoring system.

Activity 2.2. Execute 3 lake–wide acoustics surveys and subsequently analyse all the collected acoustics data, including "patchiness".

Output 3. Counterpart staff and fishing community members with a better understanding of the data and management issues involved, provided through in–service and/or group training activities;

Activity 2.1. Prepare and execute training exercises (courses, workshops) in all participating countries aimed at effective conception and use of the plan.

Output 4. An initial lake–wide fisheries management plan

Activity 4.1. Execute and report on socio–economic surveys in all four participating countries

Activity 4.2. Prepare the framework for a management plan

Activity 4.3. Draft the initial management plan

Output 5. A preliminary inter-governmental fisheries commission in operation and taking steps to implement the initial management plan;

Activity 5.1. Advise the CIFA Sub—Committee regarding the establishment and technical operations of such a preliminary commission

Output 6. An agreed plan for hand—over of current project's responsibilities and facilities to the preliminary fisheries commission and/or member governments;

Activity 6.1. Prepare a routine monitoring programme to be maintained by the nationals of all four countries after the project's completion

Activity 6.2. Prepare and agree a schedule and list for hand— over

6. The additional inputs required over 1997 to achieve these objectives are indicated below, however, although given the current political and economic difficulties facing the four countries concerned, it is already recognized that a further extension in time may be required to realise some remaining immediate objectives.

			US $
1101	Project Coordinator	12 m/m	128 628
1106	Biologist	4m/m	32 820
1151	Consultants (economics, sociology, acoustics, legal, fisheries management, etc as required)	5m/m	30 000
0000	Associate Prof. Officers (APOs)	48m/m	gratis
		Sub—total	**191 448**
1200	Admin. support personnel (inc. vessel crew)		40 000
		Component total	**231 448**
2000	Duty travel		5 000
3000	Contracts		65 000
4000	General Operating Expenses		75 000
3000	Expendable equipment		10 000
8000	Training		20 000
		Subtotal	**406 448**
9100	Project support Costs (13%)		52 838
9600	Unallocated balance		2 327
		Grand Total	**462 613**

*) Please note that this Grand Total is the amount referred to as the remaining "unallocated balance" in Mr. Bitar's facsimile letter to you, dated 5 August 1996.

GCP/RAF/271/FIN/TRAM/88

Report of Travel to Rome, Italy (22.11–2. 12. 1996)

by

**George Hanek
LTR Coordinator**

GCP/RAF/271/FIN.10

**cc: Mann, TCO4
Kapetsky, FIRI
Everett, FIPP
Ssentongo, FIPL
Turner/Smith, FIIT
All LTR Stations
Chrono
Diary: Hanek**

1. INTRODUCTION

1.1 Objective

The objectives of this duty travel were: (1) to take part in the 5th Joint Meeting of LTR Committees and the 7th Session of CIFA Sub—Committee for Lake Tanganyika and (2) to deal with LTR technical and operational matters.

1.2 Itinerary

	Arrival	Departure
Bujumbura		21.11.1996
Rome	23.11.1996	29.11.1996
Bujumbura	2.12.1996	

1.3 Persons met

Mr. M. Hayashi	ADG-FI
Dr. Y. Kato	Director, FIP
Mr. M.J. Mann	0-i-C, TCO4
Mr. G. Everett	SF20, FIP
Mr. G. Ssentongo	FLO, FIPL
Mr. J. Turner	0-i-C, FIIT
Prof. O.V. Lindqvist	University of Kuopio
Dr. H. Mölsä	University of Kuopio
Mr. M. Laamanen	Ministry of Foreign Affairs

all members of LTR Committees all members of CIFA Sub—Committee for Lake Tanganyika

2. RESULTS

2.1 5th Joint Meeting of LTR Committees

This very successful meeting was held in Rome from 25 to 26 November 1996. The meetings summary is now attached as Appendix 1.

2.2 7th Session of CIFA Sub—Committee for Lake Tanganyika

This meeting followed the previous one and took place from 27 to 28 November
1996.

2.3 Expansion of LTR activities

In addition, a follow—up meeting was held with the representative of the Finnish Ministry of Foreign Affairs. It resulted in a proposal to extend the LTR activities up to 2001; it is now attached as Appendix 2.

RESEARCH FOR THE MANAGEMENT OF THE FISHERIES ON LAKE TANGANYIKA GCP/RAF/271/FIN

REPORT OF THE FIFTH JOINT MEETING OF THE LTR'S COORDINATION AND INTERNATIONAL SCIENTIFIC COMMITTEES Rome (Italy), 25-26 November 1996

1. The Fifth Joint Meeting of the Coordination and International Scientific Committees of Project GCP/RAF/271/FIN 'Research for the Management of the Fisheries on Lake Tanganyika'(LTR) was held from 25 to 26 November 1996 in Rome, Italy.

ITEM 1: OPENING OF THE MEETING AND ELECTION OF THE CHAIRMAN

2. The Zambian delegate, Chairman of the Fourth Joint Meeting of LTR's Coordination and International Scientific Committees, welcomed the participants and observers and called the meeting to order. The list of participants is given in Annex 1.

3. Dr. Y. Kato, Director of Fishery Policy and Planning Division, welcomed all participants and observers and officially opened the meeting on behalf of the Assistant Director General for Fisheries Mr. M. Hayashi.

4. The Tanzania delegate, proposed by Burundi and seconded by Zambia, was elected Chairman. The Zaïre delegate, proposed by Burundi and seconded by Tanzania, was elected Vice Chairman.

ITEM 2 : ADOPTION OF THE AGENDA

5. The agenda (Annex 2) was adopted as proposed by the Chairman.

ITEM 3: LTR COORDINATOR'S REPORT: SUMMARY OF LTR's ACTIVITIES (DECEMBER 1995 - NOVEMBER 1996) AND REVIEW OF PROGRESS ON RECOMMENDATIONS OF THE FOURTH JOINT MEETING OF LTR COMMITTEES

6. The LTR Coordinator presented the details of LTR activities carried out during the last 12 months; they are amplified in Annex 3. The key highlights were: (1) successful completion of LTR's Scientific Sampling Programme (SSP); (2) effective execution of six lake—wide scientific cruises; (3) organization and execution of four training courses; (4) preparation of the project's revision document which outlines the objectives and activities for 1997 and 1998; (5) continued upgrading of the LTR Documentation Centre; (6) preparation and presentation of LTR's

activities at the Second World Fisheries Congress; (7) cooperation with the UNDP/GEF project RAF/92/G32 'Pollution control and other measures to protect biodiversity in Lake Tanganyika' including details on execution of an Inter—Agency Agreement between UNOPS and FAO, and (8) details on publications and reports prepared during the last 12 months.

7. The Coordinator then detailed several changes in both the field staff and the membership of the LTR committees.

8. The Chairman congratulated the LTR Coordinator and all the staff for their achievements, re—emphasized the need for close and effective cooperation with the GEF project and expressed his hope for the continued support by the key donor agencies. The Burundian delegate congratulated the LTR Coordinator for the quality of the documentation for the meeting, supported the project's extension and thanked Finland and FAO for their efforts to make the project so successful. He underlined the fact that these achievements were realized under difficult conditions which have faced the region for some time. He finally provided clarification concerning the use of *R/V Tan ganyika Explorer* and expressed a commitment of his Government to guarantee the free movement of the said vessel in the future while, at the same time, expressed his wish that the said vessel could be used even after the end of the project. The Chairman and the heads of other delegations endorsed this view and expressed their commitment to ensure free movement of project's personnel, equipment including *R/V Panganyika Explorer* as specified in LTR's Project Document.

ITEM 4: LTR SCIENTIFIC COORDINATOR'S REPORT: SUMMARY OF SSP RESULTS

9. The three years of data collection are now complete and a summary of the results are given in Annex 4. The LTR Scientific Coordinator thanked all the staff involved in the project for their dedication and for the scientifically skilful work done. He noted the high motivation of everyone working in the field and in the laboratories. The results of the research would be published in scientific journals making sure that due credit is given to all involved.

10. The delegate of Tanzania proposed that in order to increase the efficiency of LTR/Kigoma the station should be supplied with a new photocopying machine as soon as possible. The LTR Coordinator responded by stating that the project is well aware of this deficiency since the project is now operating for five years and some equipment will have to be replaced soon. To this effect FAQ already approached the AGFUND requesting additional funds for equipment and training.

11. Dr Craig presented some preliminary key results from each of the components. All data collected during the SSP have been compiled into a database which contains over 3500 files. These will be made available to all parties concerned.

12. The Chairman thanked all the staff involved in the sampling programme and thought that the report presented highlighted the extensive achievements of the study. The Zambian delegate thanked the Scientific Coordinators for their report. He mentioned that, in his view, not enough work was carried out in fish biology of which better understanding is essential for the formulation of a management plan. He further expressed his happiness to have the GEF project operational as it could be of assistance in increasing knowledge of the lake's ecosystem, his hope for the project's continuation and for a workshop prior to the end of the project to disseminate the results. Dr Craig explained that the efforts made in the fish biology component were considerable and comprehensive and several reports would soon be available. The Burundian delegate emphasized the importance of shrimps in the food chain, further stating that due to the socio—economic problems in the region and resulting changes in the fishing communities there is an urgent need to execute frame surveys in all countries.

ITEM 5: LTR MONITORING PROGRAMME: PROPOSAL

13. In response to the request of the Fourth Joint Meeting of LTR Committees Dr Craig outlined a simple and inexpensive monitoring programme; its estimated cost is approximately USS 20,000/year. It is amplified in Annex 5. He stressed the need to carry out such a programme over an extended period of at least ten years. He further proposed that such a programme be carried out by the nationals of the four countries in order to provide a regional body with information required to effectively manage the lake's resources.

ITEM 6: LTR REVISION PROPOSAL

14. This item was presented by Mr Mann and is detailed in Annex 6. He explained that the project results to date were appraised by a consultant Mr. Kuikka engaged by the Finnish Ministry of Foreign Affairs and his report was reviewed at FAO HQ in September 1996. The general conclusions were that the research programme, implemented by the project to date had yielded considerable new knowledge regarding the hydrology and fisheries of the lake, that the fisheries and the environment are normal and no risk in the collapse of the fisheries had been identified. Nevertheless the full analysis and interpretation of the data already collected needs to be completed in order to serve the next level of operation which must provide practical results for the management of the shared fish stocks and related fisheries. Lastly he underlined that considerable additional work still needs to be undertaken with the assistance of the project in order to: (1) consolidate the analysis of the data collected to date; (2) transfer and communicate the relevant information to the governments and fisher-people concerned; (3) prepare an initial lake—wide fisheries management plan; and (4) define a simple regular precautionary monitoring programme for the future.

ITEM 7: ANY OTHER MATTERS

15. Dr Menz, Coordinator of the GEF project thanked LTR and CIFA for inviting him and his colleague to the meetings. He then proceeded to give an overview of the GEF project including its objectives, proposed activities while stressing the common goals of GEF and LTR. He further outlined the project strategy indicating that its special study phase is due to start in January 1997. He informed the delegates that cooperation between the projects, both formal and informal, already existed. He expressed his wish that this continue because sharing knowledge will benefit both parties. He specifically outlined the requirements for the use of the research vessel *Tanganyika Explorer,* further stating that socio-economic studies and the preparation of a fisheries management plan are two key areas for future cooperation. Lastly Dr Menz informed the meeting that all GEF existing and future documentation would be made available to all parties.

16. The Burundian delegate again expressed his concern about the location of the GEF HQ. The Chairman informed the meeting that this item should be dealt in the appropriate forum.

17. The Chairman gave the floor to Mr Laamanen, representative of the Finnish Ministry of Foreign Affairs. He expressed the Ministry's satisfaction with LTR's achievements to date, confirmed his Ministry's commitment to fund LTR's activities during 1997 and 1998 and, lastly, indicated that further efforts will be made to increase the funding committed for the next two years while hoping that it will be possible to support LTR beyond the year 2001.

18. The Chairman and heads of all delegations thanked Mr Laamanen and asked him to convey their appreciation to the Government and people of Finland for their continuing support of LTR.

19. The Chairman and heads of all delegations also expressed their appreciation to the AGFUND for its continuing support of LTR.

20. The LTR Coordinator informed delegates on recent developments in the preparation of navigational charts for Lake Tanganyika and sought their support to pursue this matter further. The Chairman and the members gave approval to this requesting the LTR Coordinator and FAO to proceed with this matter in cooperation with the International Hydrographic Organisation in order to secure the required funding for the preparation of navigational charts for Lake Tanganyika.

21. The delegate of Tanzania in formed the members that the officers of *R/V Tanganyika Explorer* have experienced contractual problems. Specifically, because of the difficult situation in the region the two of the officers did not receive salary for three months while the *R/V Tanganyika Explorer* was retained in the harbour of Bujumbura. He subsequently proposed that the contracts of officers are finalized as soon as possible in order to guarantee the efficient operation of the said vessel. These

contracts should include a provision for overtime payments in order to limit their financial loss.

ITEM 8: DATE AND VENUE OF THE NEXT MEETING

22. The Zambian delegate informed the members that his government had offered an invitation to host the Sixth Joint Meeting of LTR Committees in Zambia. The Chairman thanked the Zambian delegate for this offer charging LTR to consider appropriate venue and dates for such a meeting in due course.

ITEM 9: ADOPTION OF THE REPORT

23. The Coordination and International Scientific Committees adopted the report on 26 November 1996.

24. The delegate of Zambia thanked the Chairman for his effective chairmanship and wise guidance which allowed for effective deliberations.

25. The Chairman thanked all participants for their good preparation and constructive debate. Lastly, he thanked the secretariat, the FAa, observers and translators for their good work.

RESEARCH FOR THE MANAGEMENT OF THE FISHERIES ON LAKE TANGANYIKA
GCP/RAF/271/FIN

ANNEX 1

FIFTH JOINT MEETING OF THE LTR'S COORDINATION AND INTERNATIONAL SCIENTIFIC COMMITTEES

Rome (Italy), 25-26 November 1996

LIST OF PARTICIPANTS

Burundi		
Ir. S. BAMBARA	Conseiller	Département des eaux, pêche et pisciculture, Ministère de l'Agri culture et de 1'Elevage Bujumbura
Dr. B. NYAKAGENI	Coordonnateur technique	Ministère de 1'Agri-culture et de l'Elevage Bujumbura
Mr. E. HADJIANDREOU	Director	Tanganyikaise SARL Bujumbura
Tanzania/Tanzanie		
Mr. T. W. MAEMBE	Director of Fisheries	Ministry of Natural Resources and Tourism Dar es Salaam
Prof. P.O.J. BWATHONDI	Director General	TAFIRI - Kunduchi
Zaïre		
Mr. A. SAMBA MOOMI TE	Représentant Permanent	Représentation Permanent du Zaïre auprès de la FAO, Rome
Mr. M.K. KALIBU	Directeur des Pêches	Ministère de l'Environ nement de la

		Conservation de la nature et du tourisme Kinshasa

Zambia/Zambie

Mr. H. G. MUDENDA	Director of Fisheries	Ministry of Agriculture Food and Fisheries Chilanga
Mr. M.A. KATUNDU	Chief Fisheries Research Off.	Ministry of Agriculture Food and Fisheries Chilanga

OBSERVERS / OBSERVATEURS

Finland/Finlande

Prof. O.V. LINDQVIST	Professor	University of Kuopio Kuopio
Dr. H. MOLSA	Professor	University of Kuopio Kuopio
Mr. M. LAAMANEN	First Secretary	Ministry of Foreign Affairs Helsinki

United Kingdom/Royaume Uni

Mr. G. PATTERSON		NRI Chatham, Kent
Dr. A. MENZ	Project Coordinator	GEF Project Dar es Salaam

FISHERIES DEPARTMENT/
DEPARTEMENT DES PECHES

Headquarters/Siége

Mr. G.W. SSENTONGO	Fishery Liaison Officer	FAO, FIPL Rome - Italy
Mr. G. EVERETT	Senior Fishery Planning Officer	FAO, FIPP Rome - Italy
Dr. J. KAPETSKY	Senior Fishery Resources Officer	FAO, FIRI Rome — Italy
Mr. M. MANN	Senior Project Operations Officer	FAO, TCO4 Rome - Italy

SECRETARIAT

Dr. G. HANEK	LTR Coordinator	LTR Bujumbura — Burundi
Dr. J.F. CRAIG	LTR Bio-Statistician	LTR Kigoma - Tanzania

Research for the Management of the Fisneries on Lake Tanganyika (GCP/RAF/271/FIN)
EXPANSION OF THE ACTIVITIES OF THE LTR IN 1997 AND 1998 AND FOLLOW ON ACTIVITIES IN 2000 AND BEYOND
JUSTIFICATION

A meeting of the Ministy for Foreign Affairs of Finland representative of the University of Kuopio, and FAO was held on 28/11/95 to appraise the activities of the extension of the project and to examine needs for expansion and extension of some of them.
The general conclusions were that the research programme implemented by the project to date had yielded considerable new data and valuable knowledge for the design of a management programme. Nevertheless, it was concluded that further analysis and interpretation of the unique data has to be concluded in 1997 and 1998 in order to fully realize the benefits of this work. Additionally, there is the need for a follow on activity to consolidate management recommendations for the benefit of the fishing communities of the riparian countries.
Considerable additional work has to be undertaken spe4fically:

1997

to ensure the proper execution of the project extension phase by providing additional funding in order to:

- *complete and consolidate the applied research, mainly analyses and reporting of field activities already completed*
- *strengthen the field activities to ensure continuity of information flow and training to further increase the capacity of the national staff, mainly in hydroacoustics*
- *produce an educational video on the project's activities and the practical implications of the results for fishenes management*

1998

- *continuation of strengthening the field activities to ensure continuity of information flow and training to further increase the capacity of the national staff, as in 1997*
- *a seminar on management of the fisheries and resources of the lake to disseminate the final results, conclusions and recommendations of the project. In order to ensure the broadest possible dissemination, the*

seminar will be held in the region.

1999 to 2001

Follow-on activities to support the work of national institutions to implement the project's results and recommendations on management:

- *Institutionalization of the resource fisheries monitoring programme*
- *technical backstopping on implementation of the monitoring programme*
- *final evaluation of the project and impact*

Estimated Budget

1997
$200,000

1998
$405,000

1999 to 2001
$200,000

Contingencies
$45,000

Total
$850,000

GCP/RAF/271/FIN/TRAM/89

Report of Travel

to

Kigoma (Tanzania)

and

Mpulungu (Zambia)

(15–27.11.1996)

by

**P. Kotilainen, K. Salonen, I. Kimosa, N. Chale,
R. Makere and A. Suleiman**

GCP/RAF/271/FIN.10

cc. Mann, TCO4
Everett, FIPP
Kapetsky, FIRI
Lindqvist/Mölsä, Kuopio
Huttula/Peltonen, Tampere
Salonen/Järvinen, Helsinki
LTR, Kigoma
LTR, Mpulungu
Chrono, LTR, Bujumbura
Trains, LTR, Bujumbura
Diary:Hanek
Diary. Kotilainen

GCP/RAF/271/FIN **December, 1996**

FORM TE/3

LAKE TANGANYIKA RESEARCH

1996 RESEARCH VESSEL PROGRAMME

PROGRAMME: R/V TANGANYIKA EXPLORER CRUISE 96/10

NAME	POSITION
1. Huttula, T	Hydrologist, cruise leader...
2. Salonen, K	Scientist
3. Järvinen, M	Scientist
4. Savinainen, M	Civil engineer
5. Kotilainen, P	Hydrologist
6. Verburg, P	Hydrologist
7. Mambona wa Bazolana, C	Hydrologist
9. Kissaka, M	Hydrologist
10. Makasa, L	Hydrologist
11. Tumba, J-M	Hydrologist

DURATION 15-27.11.96

LOCALITY
1. Kigoma 15.11.96
2. Mpulungu 18.11.96
3. Kigoma 23.11.96
4. Malagarasi 25.11.96
5. Kigoma 27.11.96

PLAN (all times are Greenwich Mean Time **+** 2)

LTR Coordinator

Date:

INITIALED GH

SHIP:R/V TANGANYIKA EXPLORER CRUISE NUMBER: 10/96

CRUISE ITINERARY REQUIRED: (start, stop, port call(s) track chart)

1. Departure from Kigoma 15.11.
2. Arrival in Mpulungu 18.11 and departure from Mpulungu 19.11.
3. Arrival in Mpulungu 20.11 and departure from Mpulungu 21.11.
4. Arrival in Kigoma 23.11 and departure from Kigoma 25.11.
5. Arrival in Kigoma 27.11.

SENIOR SCIENTIST: Dr. T. Huttula Regional Environmental Agency of Häme (REAH)

SCIENTIFIC STAFF LIST: (including affiliation)

Name	Laboratory	Institution	DATES Boarding	DATES Disembarking
Huttula, T.	Hydrodynamics Cruise leader	REAH	Kigoma 15.11.96	Mpulungu 19.11.96
Salonen, K.	Prim, product.	Univ.Helsinki	Kigoma 15.11.96	Kigoma 23.11.96
Järvinen, M.	Prim, product.	Univ.Helsinki	Kigoma 15.11.96	Kigoma 23.11.96
Savinainen, M.	Engineer	University of Joensuu	Kigoma 15.11.96	Kigoma 23.11.96
Kotilainen,P.	Hydrodynamics	LTR/Bujumbura	Kigoma 15.11.96	Kigoma 27.11.96
Verburg, P.	Hydrodynamics	LTR/Kigoma	Kigoma 15.11.96	Kigoma 27.11.96
Mambona wa Bazolana, C.	Hydrodynamics	LTR/Uvira	Kigoma 15.11.96	Kigoma 27.11.96
Kissaka, M.	Hydrodynamics	LTR/Kigoma	Kigoma 15.11.96	Kigoma 27.11.96
Makasa, L.	Hydrodynamics	LTR/Mpulungu	Kigoma 15.11.96	Kigoma 27.11.96
Tumba, J-M	Hydrodynamics	LTR/Bujumbura	Kigoma 15.11.96	Kigoma 27.11.96

EQUIPMENT TO BE USED:

1. Equipment supplied by LTR/Bujumbura
   ADCP (Acoustic Doppler Current Profiler)
   Workhorses (Current profilers)
   DGPS (Differential Global Positioning System)
   CTD probe for temperature/conductivity profiles
   Mid-water trawl
   Trawl sonde cable 700m (maximum length)
   Oceanographic winch 300 meters
   Fluorometer
   Incubator
   Limnos water samplers
   Accessories for primary production studies

2. Equipment supplied by LTR/Kigoma
   Accessories for primary production studies

3. Equipment from other sources:
   Meteorological station on board *R/V TANGANYIKA EXPLORER*
   Special equipment and accessories for primary production studies

4. Winch and wire requirements.
   Oceanographic winch 300 meters

SCIENTIFIC OR SURVEY OBJECTIVES:

1) to study space and time variations of flow fields of the lake during the rainy season.

2) to carry out intensive measurements on currents off of the Malagarasi and Lufubu River estuaries.

3) to test the Differential Global Positioning System (DGPS) in practice.

4) to do the maintenance for the LTR hydrodynamic equipment and automatic recorders around the lake.

5) to give practical training on the new equipment to counterparts.

6) to carry out special studies mainly on *Limnocnida tanganyicae* and picoplankton in order to establish a size distribution of *L. tanganyicae,* its biomass, dry and ash free weight, respiration rate and feeding on zooplankton and to have a better understanding about the role of picoplankton in the lake ecosystem by estimating the number of cells of picoplankton per volume and its growth rate.

7) to test the transducer of the trawl net sonde.

8) to do the fumigation of the R/V TANGANYIKA EXPLORER in Kigoma.

CRUISE PROCEDURES AND STATION PATTERN REQUIRED:

FORM TE/5

CRUISE SUMMARY

SHIP:RV/TANGANYIKA EXPLORER CRUISE NUMBER: 96/10 SENIOR SCIENTIST(S) : Huttula, T.

LIST OF SCIENTIFIC STAFF ACTUALLY PARTICIPATING

Name	Laboratory	Institution	DATES Boarding	Disembarking
Huttula, T.	Hydrodynamics Cruise leader	REAH	Kigoma 15.11.96	Mpulungu 19.11.96
Salonen, K.	Prim. product.	Helsinki Univ.	Kigoma 15.11.96	Kigoma 23.11.96
Järvinen, M.	Prim, product.	Helsinki Univ.	Kigoma 15.11.96	Kigoma 23.11.96
Savinainen,M.	Engineer	University of Joensuu	Kigoma 15.11.96	Kigoma 23.11.96
Kotilainen,P.	Hydrodynamics	LTR/Bujumbura	Kigoma 15.11.96	Kigoma 27.11.96
Verburg, P.	Hydrodynamics	LTR/Kigoma	Kigoma 15.11.96	Kigoma 27.11.96
Mambona wa Bazolana, C.	Hydrodynamics	LTR/Uvira	Kigoma 15.11.96	Kigoma 27.11.96
Kissaka, M.	Hydrodynamics	LTR/Kigoma	Kigoma 15.11.96	Kigoma 27.11.96
Makasa, L.	Hydrodynamics	LTR/Mpulungu	Kigoma 15.11.96	Kigoma 27.11.96
Tumba, J-M	Hydrodynamics	LTR/Bujumbura	Kigoma 15.11.96	Kigoma 27.11.96

ITINERARY ACCOMPLISHED:

Kigoma - Mpulungu:

1) Departure for Utinta 15.11.96.

2) Sailing to Utinta, 15—16.11.96.

3) Arriving in Utinta 16.11.96, 0830 hrs.

4) Current measurements off Utinta and testing the DGPS.

5) Sampling in the southern part of the lake 16– 18.11.96.

6) Arrival in Mpulungu 18.11.96.

7) Departure for the Lufubu River estuary and the lake meteorological station off Mpulungu.

8) Arrival in Mpulungu 19.11.96 and disembarking T. Huttula.

Mpulungu - Kigoma:

1) Departure from Mpulungu 21.11.96 at 1915 hrs.

2) Sampling in the southern part of the lake and unloading the lake meteorological station off Mpulungu 21-22.11.96.

3) Sampling in the southern and the central part of the lake 22– 23.11.96.

4) Visiting the lake meteorological station off Kigoma and arrival in Kigoma 24.11.96 at 0830 hrs., disembarking Finnish scientists.

5) Departure for the Malagarasi River estuary 25.11.96 at 0930 hrs.

6) Intensive measurements in the Malagarasi River estuary 25-27.11.96 and returning to Kigoma.

SCIENTIFIC OR SURVEY ACCOMPLISHMENTS:

(with brief statements explaining failures to achieve objectives)

1) Hydrodynamics:

Kigoma - Mpulungu

The current flow fields were studied from Utinta to Mpulungu and several CTD profiles were measured. The automatic meteorological station was from Kigoma to deployed Mpulungu. There were a few short gaps in the data collection due to the interference of HF radio. An intensive study on currents was carried out in the Lufubu River estuary. The maintenance of the lake meteorological station off Mpulungu was done and the DGPS tested in the Utinta area.

Mpulungu - Kigoma

The current flow fields were studied in the southern part of the lake and several CTD profiles were taken. The automatic meteorological station was run continuously from Mpulungu to Kigoma. The maintenance of the lake meteorological station off Mpulungu was completed.

Kigoma - Malagarasi

An intensive study in current flow fields was carried out in the Malagarasi River estuary and several CTD-profiles were taken during the sampling.

2) Primary production

Picoplankton: Estimation of the importance of picoplankton in the food chains of Lake Tanganyika.

a) The number of cells of picoplankton per volume was estimated by microscopic counting using the autofluorescence of the photosynthetic pigments.

b) The growth rate and grazing of picoplankton were estimated by studying the increment of cell number in the water where from grazers were filtered out and in the unfiltered water (=grazers included)

c) Nutrient enrichment experiment during phytoplankton bloom was carried out by measuring its primary production with a radiocarbon method. Used enrichments were: phosphate-phosphorus, nitrate-nitrogen and a combination of the two.

d) As a reference for picoplankton the Bacteria were counted in the water samples after DAPI staining with an epifluorescence microscope.

Limnocnida tanganyicae, jellyfish: To evaluate the ecological role of *L. tanganyicae* in the lake.

a) Zooplankton were counted in guts of jellyfish.

b) Respiration of jellyfish was measured in 25—50 ml bottles with an oxygen electrode.

c) Photosynthesis of the endosymbiotic picoplankton of jellyfish was estimated by measuring the oxygen concentration both in dark and light conditions with an oxygen electrode.

d) The size distribution of jellyfish (diameter of bell) was measured.

e) The ash free weight of jellyfish will be estimated. Measured individuals were dried and taken to Finland to finalize the work.

3) The trawl sonde was tested 27.11.96 and it seemed to be working perfectly. Testing depth was at maximum 85 meters.

4) The *R/V TANGANYIKA EXPLORER* was fumigated 29.11.96 and a certificate of fumigation received from the health authorities of the Kigoma port.

PROBLEMS ENCOUNTERED, SUGGESTED IMPROVEMENTS, ETC.

Scientific equipment and sampling facilities

1) Hydrodynamics

a) Despite successful data collection several problems with the new equipment were discovered. The hardware of the ADCP deck box was noticed to be incomplete to collect proper heading information from boat's Gyro compass. Anyhow, this didn't hinder the data collection itself but required much more manual work.

The mounting of the Workhorses to buoys was incomplete and only temporal installation could be used during the cruise.

Therefore, RD Instruments should be contacted for delivering the missing parts for the ADCP deck box hardware and for proper mounting of the Workhorses to the buoys.

b) The DGPS could not be made working properly.
One unit of the DGPS was sent to Finland and will be checked by the manufacturer.

c) The planned training of counterparts couldn't be fully carried out due to problems with the new equipment, but should be completed during the next cruise early next year.

General matters

a) Unstable voltage on board *R/V TANGANYIKA EXPLORER* was causing problems, although several attempts have earlier been made to stabilize it. Furthermore, the difference in voltage between the ship's body and instruments plugged to 220V was noticed to be 130-160V. Due to that, a serial port of one of the computers used on board was burned.

Therefore, at least two uninterruptable power supplies (UPS) should be purchased for *R/V TANGANYIKA EXPLORER* or the constructor of the vessel contacted in order to determine the reason of unstable voltage and to avoid any further loss of equipment (Re: cruise reports 95/01, 95/04 and 96/07 and Trams 64, 70)

Furthermore, a new board for the computer should be purchased to replace the burned one.

During the cruise the meteorological station data collection on board was blocked several times while using the High frequency radio ICOM-700. Most probably the problem is related to the unstable voltage on board.

b) The air conditioning system aboard was leaking at several places. The problem exists especially when the lake is rough.

The constructor should be contacted to solve the problem to avoid any further loss of scientific equipment (Re: cruise reports 95/01, 95/05 and 96/07 and Trams 64, 70)

GCP/RAF/271/FIN/TRAM/90

Report of Travel to Lusaka & Mpulungu (Zambia) and Kigoma & Dar es Salaam (Tanzania) (2–20.1.1997)

by

**George Hanek
LTR Coordinator**

GCP/RAF/271/FIN.10

cc: Mann, TCO4
Kapetsky, FIRI
Everett/Gréboval, FIPP
Ssentongo, FIPL
Turner/Smith, FIIT
Maembe/Bwathondi, URT
Mudenda, UN
FAOR's - BDI, URT and ZAM
Menz, NRI/GEF
All LTR Station.
Chrono
Diary: Hanek

1. INTRODUCTION

1.1 Objective

The objective. of this duty travel were: (1) to visit all LTR stations; and (2) to brief all LTR staff (national and international) on key decisions and conclusions of the 5th Joint Meeting of LTR Committees; (3) to present LTR's Work Programme for 1997-98; (4) to deal with other project matters (*R/V Tanganyika Explorer*, meet the local authorities, etc).

1.2 Itinerary

	Arrival	Departure
Bujumbura		23.12.96
Nairobi	23.12.96	24.12.96
Lusaka	24.12.96	6. 1.97*
Mpulungu	6. 1.97	10.1.97
Kigoma	12.1.97	17.1.97
Dar es Salaam	17.1.97	18.1.97
Nairobi	18.1.97	20.1.97
Bujumbura	20.1.97	

* Annual Leave taken from 24.12.96 to 2.1.1997 (in Zambia & South Africa)

1.3 Persons met

in Lusaka

Mr. H.G. Mudenda	Director of Fisheries
Mr. Fortes	FAO Admin. Officer

other FAO Representation staff in Mpulungu

Ms. P. Paffen	APO - LTR/Mpulungu
Mr. V. Langenberg	APO - LTR/Mpulungu
Mr. Mwape	O-i-C/DOF-Mpulungu
+ all DOF/Mpulungu staff	
Mr. A.M. Sichizuwe	Sub-Manager, New Capital Bank
Mr. L.L. Sifaya	Examining Officer of Customs
Mr. Ngulube	Chief Immigration Officer
Mr. C. Blighnault	GM, Samaki Ltd.
Mr. D. Chileshe	GM, Sopelac Ltd.

Captain & Chief Engineer of *M/V Tora* in Kigoma

Ms. E. Bosnia	APO - LTR/Kigoma
Mr. P. Verburg	APO - LTR/Kigoma
Mr. D. Chitaawebwa	Director a.i. TAFIRI/Kigoma
+ all TAFIRI/Kigoma staff	
officers & crew of *R/V Tanganyika Explorer*	
Hon. Y.R. Makamba	Regional Commissioner of Kigoma
Mr. J.T. Mahenabe	Manager, The National Bank of Commerce

in Dar es Salaam -
Dr. A. Menz Coordinator, NRI/GEF

2. RESULTS

2.1 at Lusaka

The Director of Fisheries, FAOR a.i. and the Adinin. Officer were all briefed on (1) the key decisions and conclusions of the 5th Joint Meeting of the LTR Committees and (2) LTRs objectives, activities and Programme of Work for 1997–98. In addition, the Director of Fisheries (1) promised to strengthen our LTR/Mpulungu socio-economy team by three DOF/Chilanga based officers i.e. Mr. R. Chitembure (Fisheries Statistician), Mr. J. Mungomba (Fisheries Assistant) and Mr. C. Samende (Fisheries Assistant) (2) arranged and accompanied me to a meeting with the Director of Ministry of Agriculture Information Service which is capable to produce an educational video on LTR and (3) agreed the venue for the 6th Joint Meeting of the LTR Committees will be Kasaba Bay.

While at Lusaka I was informed re: Langenbergs medical evacuation (Mbala– Lusaka) in early December. Mr. G. Mburathis, FAOR/Lusaka, effective assistance in this matter as well as his regular visits to the Hilltop Hospital (he was bringing the food and drinks to Victor!!!; other FAOR's kindly note!!!) are now recorded, with deepest appreciation.

2.2 at Mpulungu and at Kigoma

General : LTR/Mpulungu station is extremely well organized, there is an excellent cooperation/relations among the LTR international staff, the DOF/Mpulungu staff and Mpulungu/Mbala authorities and business community. LTR/Kigoma station was always well run and there continue to be good cooperation between

Specific:

A. General meetings with all LTR/DOF - Mpulungu and LTR/TAFIRI - Kigoma staff took place (at Mpulungu on 7.1.97, at Kigoma on 14.1.97) noting identical one was held with all Department of Fisheries and LTR/Bujumbura staff on
22.1.1997. I have briefed all on: (1) key decisions and conclusions of the 5th Joint Meeting of the LTR Committees and (2) explained and specified the LTR objectives, activities and Work Programme for 1997-98 as follows:

1. Consolidation of SSP

1.1 complete the analyses of collected data, mainly for January–July
1996;

1.2 acoustics surveys – at least three more lake–wide cruises should take place *i.e.* in March/April and August/September 1997 and January/February 1998;

1.3 CPUE study - for Lake Tanganyika will be carried out by consultant (Eric Coenen) during March 1997. Ms. Paffen was instructed to ensemble all required data during January/February 1997; she will also assist Mr. Coenen.

1.4 complete remote sensing and primary production studies – at Kuopio and Turku; and

1.5 complete the final scientific report – responsible: Prof 5. Lindqvist, Sarvala, Molsa and LTR Coordinator.

2. Socio–economic studies

2.1 propose TOR for socio–economy consultant;

2.2 form socio–economv teams at each LTR station (see Appendices 1–3);

2.3 conduct Workshop/Training course for socio–economy team leaders (2 persons/country) at LTR/Kigoma asap after Easter 1997; duration: 10 days;

2.4 execute lake–wide socio–economv survey – during May–July 1997;

2.5 analyse all collected data & complete reporting (responsible: all LTR APO's: Bosma, Langenberg, Paffen, Verburg and Waeterloos under supervision of LTR Coordinator and socio-economy consultant) during August-October 1997.

3. Monitoring programme

3.1 finalize LTR Monitoring Programme:

3.2 form Monitoring Programme teams at each LTR station (see Appendices 1–3);

3.3 start Monitoring Programme in July 1997.

4. Inter-Agency Agreement

4.1 Select 4 national technicians/hvdrologists as replacement for national hydrologist; persons selected are: Mr. Tuinba (Burundi), Kissaka (URT), Kakogozo (Zaïre) and Makassa (Zambia). It was agreed with Dr. Huttula that Mr. Kotilainen prepares detailed TOR's for each of these persons and that all start working exclusively and full-time on hydrodynamics (at $100/person/month) as of 1.2.1997 until 30.11.1997;

4.2 Execute two more lake–wide cruises i.e. 3rd and 4th one under this agreement as follows: one in April/May and the last during August 1997;

4.3 Continue modelling - at Tampere; and

4.4 Complete final report for official submission by FAO to UNOPS (responsible: Dr. T. Huttula; latest date of report submission to TCO4: 30.11.1997).

5. Other matters

5.1 Cooperation with the project GEF - it was explained that LTR is ready to cooperate with the GEF project once their field operations start. In addition it was explained that LTR has no problem in 'sharing' the national colleagues with the project GEF as this arrangement should benefit all parties.

5.2 Equipment – the 0–i–C's of each station were requested to prepare a list of equipment and other material which needs to be repaired and/or replaced. At LTR/Mpulungu all equipment in still OK; exception is project's car which has over 106,000 km; the tires and shock absorbers need to be replaced asap. The list prepared by LTR/TAFIRI - Kigoma is now attached as Appendix 4. In addition, both projects cars at Kigoma are in very good condition and have low mileage (Landcruiser: 48,448 km and Toyota Pick-up: 37,274 km).

6. Other matters

1. LTR staff – all four APO's expressed their wish to continue with the LTR after completing their 4 years of service (NOTE: NTE of Bosma and Verburg:
8.10.1997; NTE of Paffen: 13.11.1997 and NTE of Langenberg: 30.11.1997). I have explained that a request to this effect will be made by TCO4 to the Dutch authorities although the chances of obtaining it are small. All four would of course prefer if the LTR could keep them on expert level for the project's duration **i.e.** until December 1998. I stated that this is also quite unlikely as the budgetary situation is still not clear. In any case, the LTR should maintain presence at its all main research stations until its extension phase is completed (31.12.1998). Thus and if APO Waeterloos is accepted by the Government of URT our presence at Kigoma will be assured BUT not at LTR/Mpulungu. In addition two meetings were held with the officers and crew of *B/V Tanganyika Explorer;* it was explained again that the TCOX/P should be forwarding their contracts soonest. All other outstanding questions, etc. were also resolved.

2. Reporting – was discussed and agreed upon with all 4 APO's as follows:
Langenberg: four TD's (SSP limo data for January-July, 1996; overview of limno data for June, 1993 - July, 1996; limno data from cruises and precipitation); Paffen: two TD's (summary of 4 frame surveys and CPUE with Coenen); Bosma: two TD's (SSP

zooplankton data for January-July 1996; shrimp data and analysis); Verburg: two TD's (hydrodynamics and one short on lake's water levels).

3. Meetings with local authorities - accompanied by 0-i-C of each station (Messrs. Mwape and Chitamwebwa) I have met with the authorities. The most important was held with the Hon. Y. Makamba, Regional Commissioner of Kigoma who was fully briefed on LTR's present and future activities (meeting's summary now attached a Appendix 5).

4. Meeting with the Captain and Chief Engineer of *M/V Tora* - this vessel is blocked at Mpulungu since August 1996. Some time ago La Tanganyikaise Sarl promised that the maintenance of B/V *Tanganyika Explorer* will be done by the Chief Engineer of *M/V Tora.* It should be noted that the Chief Engineer was not aware of this arrangement!!!

5. Changing banks at Mpulungu - is strongly recommended. The service offered by the New Capital Bank are much more professional (see Appendix 6).

6. New Years Party — somewhat delayed but nevertheless organized and paid for by your truly at all LTR stations as follows: at Mpulungu on 9.1.1997, at Kigoma on 16.1.1997 and at Bujumbura on 24.1.1996 (for details see LTR Newsletter No. 21).

2.3 at Dar es Salaam

A meeting was held with Dr. Andy Menz, Coordinator of GE? project. I gave him an identical briefing as detailed under 2.2 above. He briefed me on GEF's activities (there is a socio—economy team at Kigoma right now; on join cruise, etc) and informed me re: upcoming changes of his personnel at Kigoma (Ms. Kelly West will be replacing Dr. Banister) and at Mpulungu (Mr. Martin Pearce will be working for GEF, part—time). Lastly, I have handcarried some correspondence from Dr. Menz to the Burundese involved in the GEF project.

Lastly, an attempt was made to reach Messrs. Maembe and Yonazi. It was not successful (Saturday) so I have left copies of Appendix S and a request to speed up the URT Govt. acceptance of APO Waeterloos with Dr. Menz for forwarding to Messrs. Bwathondi, Macnabe and Yonazi.

3. CONCLUSIONS AND FOLLOW-UP

3.1 Prepare script for educational video on LTR activities and forward it to Mr. Mudenda.
(Action: LTR Coordinator)

3.2 Make contact with the new owners of Kasaba Bay Lodge and determine if our 6th Joint Meeting of LTR Committees could be held there, providing full details on costs, etc. (Action: Mr. Langenberg)

3.3 Make final selection of national teams for socio—economy and Monitoring Programme, informing the 0-i—C's concerned. (Action: LTR Coordinator)

3.4 Confirm the availability of Messrs. Eero Aro and Andy Smith for the next acoustics cruise (March/April, 1997). (Action: Dr. Mölsä for E. Aro and Jeremy Turner for Andy Smith)

3.5 Fax Petra Paffen TOR's for Eric Coenen's mission. (Action: LTR Coordinator)

3.6 Consolidate all required data for CPUE consultancy and sent all data to Eric Coenen. (Action: Petra Paffen)

3.7 Finalize Author's Contract for Eric Coenen as per TOR already proposed; noting his next availability is as of mid-March 1997. (Action: Mr. M.J. Mann, TC04)

3.8 Follow—up on primary production and remote sensing studies. (Action: Dr. Mölsä)

3.9 Propose TOR for consultant (socio—economy). (Action: LTR Coordinator and Dr. Gréboval, FIPP)

3.10 Specify the requirements for the lake—wide survey on socio—economy. (Action: Dr. D. Gréboval, FIPP)

3.11 Finalize Monitoring Programme, verify costs, etc. (Action: LTR Coordinator)

3.12 Prepare detailed TOR's for four technicians (hydrologists) asap. (Action: Mr. Kotilainen)

3.13 Purchase four new tires and shock absorbers for LTR/Mpulungu car ASAP. (Action: Mr. Langenberg)

3.14 Request the Dutch authorities to extend the finding of the four APO's until December 1998. (Action: Mr. M.J. Mann, TCO4)

3.15 Speed-up the URT Gov't acceptance of APO Waterloos. (Action: Messrs. Maembe and Yonazi)

3.16 Propose contracts for the officers of *B/V Tanganyika Explorer* ASAP. (Action: TCOX/P)

3.17 Issue TA for Mr. Langenberg ASAP, authorizing FAOR/Lusaka!! Itinerary:
Mpulungu Nairobi Bujumbura Mpulungu; duration: 14 days (starting:7.2.1997) ; objective: to finalize, under LTR

Coordinator's supervision, two Technical Documents. (Action: Mr. M.J. Mann, TCO4)

3.18 Do not pay La Tanganyikaise for SSA-maintenance. (Action: Mr. M.J. Mann, TC04)

3.19 Maintain contact with the Hon. Y. Makamba, Regional Commissioner, providing him with copies of correspondence particularly the one concerning the cruises. (Action: Messrs. Hanek and Mannini)

3.20 change the banks for LTR/Mpulungu imprest account as per Appendix 6. (Action: TCO4 and TCOX)

3.21 Maintain contact with Dr. Menz. (Action: LTR Coordinator)

Appendix 1

Proposed Department of Fisheries members of staff to be attached to LTR project in the new phase.

Monitoiing Team

Fish Biology / Fish Sta~sfics
NJ. Mwenda, M. Syapila (L.M. Mwape and G. Milindi).

Limnology
C. Lukwesa and (L.M. Mwape)

Zooplankton
K. Kaoma and I. Zulu

Social Economical Survey Team
(L.M. Mwape and G. Milindi)
Kaweme (L. Mutale)
W. Chomba
J. Chimanga
B. Kashikila
3 from Chilanga

TANZANIA FISHERIES RESEARCH INSTITUTE

Kigoma Centre,
P.O. Box 90,
Kigoma.

Ref. No. TAFIRI/KGM/S.100/Vol.II/891 16.01.1997

Dr George Hanek,
LTR Coordinator,
Bujumbura.
BURUNDI.

LIST OF TANZANIA NATIONALS FOR LTR ACTIVITIES

1. **Monitoring Programme**

1.1 Hydrodynamics (1)
Mr M.B.S. Kissaka (Research Officer)

1.2 Limnology (2)
Mr D.B.R. Chitamwebwa (Senior Research Officer)
Miss Dinna Lyoba (Technician)

1.3 Zooplankton (2)

Mr A.N.M. Kalangali (Research Officer)
Mr S.K. Muhoza (Senior Technician)

1.4 Fish Biology (3)

Mr K.I. Katonda (Senior Research Officer)
Mr E. Kadulla (Technician)
Mr O. Kashushu (Technician)

1.5 R/V Echo crew (2)

Mr M. Chatta
Mr R. Wakafumbe

2.0 **Socio-economic studies** (6)
Ms E. Lyimo (Senior Fisheries Officer)
Mr D.B.R. Chitamwebwa (Senior Research Officer)
Mr K.I. Katonda (Senior Research Officer)
Mr M.B.K. Kajelelo (Personnel & Admin. Officer)
Mr Mr U. Kisisiwe (Technician)
Mr M. Chatta (Able Seaman)

D.B.R. Chitamwebwa
Ag. Centre Director

REPUBLIQUE DU BURUNDI

Bujumbura, le 24/07/97

MINISTERE DE L'AGRICULTURE ET DE L'ELEVAGE

Département de la Pêche et Pisciculture

Réf. : 775/ 30 /97

V/Réf. : .....

A Monsieur le Coordonnateur
du Projet RLT
à

BUJUMBURA

Objet :

Biologistes des Pêches
au Projet

Monsieur le Coordonnateur,

J'ai l'honneur de vous envoyer les Biologistes de pêche suivant:

RUTOZI Dieudonné, NIKOMEZE Edouard, TUMBA Jean Marie
NICAYENZI Félix, GAHUNGU Emmanuel, BUTOYI Canésius.

Vous pourriez analyser favorablement les avantages à accorder aux futurs formateurs: RUTOZI Dieudonné et NICAYENZI Félix. Les intéressés sont des cadres expérimentés qui ont travaillé avec le projet CRRHA.

Veuillez agréer, Monsieur le Coordonnateur, l'assurance de ma considération distinguée.

LE DIRECTEUR DU DEPARTEMENT
DES EAUX, PECHE ET PISCICULTURE

KANYARU [illegible]

C.P.I.A:
- Monsieur le Directeur Général de l'Elevage à GITEGA
- Monsieur le Coordonnateur National Scientifique à BUJUMBURA
- Les intéressés.

B.P. 1850 Téléphone : 22 6378 Bujumbura

TANZANIA FISHERIES RESEARCH INSTITUTE

Tel. 3625
Telegram "TAFIRI KIGOMA"

Kigoma centre,
P.O. Box 90,
KIGOMA.

Ref. No. TAF/KGM/LTR

23.01.1997

Dr. G. Hanek
LTR Coordinator
Bujumbura, BURUNDI.

EQUIPMENT TO BE REPLACED OR PURCHASED

Please refer to the recent talk (Hanek/Chitamwebwa) on the above subject. Hereunder I list the items as follows:

1. Portable Hach One PH Meter Mod. 43800 - 00
2. 5 Electolyte cartridges Cat. No. 21950 - 01
3. Portable Hach conductivity - TDS Meter (repair/purchase)
4. Turbidity sample cells (set) Cat. No. 21003 - 00
5. Y S I Oxygen probe service kit
6. One multi-channel counter Model MCC-20A
7. New Photocopier, preferabl larger than the present one
8. Laser Jet Printer
9. Sartorius weighing scale (1 kg x 0.0001g)
10 2 stainless steel metre rules for measuring boards

D.B.R. Chitamwebwa
Ag. Centre Director
TAFIRI - KIGOMA.

Note for the File

Meeting was held on 14.1.1996 at the office of the Commissioner of Kigoma Region. Present: Hon. Y. Makamba, Commissioner of Kigoma Region, Mr. D. Chitamwebwa, Director a.i., TAFIRI/Kigoma and Dr. G. Hanek, LTR Coordinator.

After initial introductions the LTR Coordinator firstly thanked the Regional Commissioner for his continuous assistance and particularly for including the project on the itinerary of H.E. the President of the URT during his visit to Kigoma in October 1996. He then briefed the Commissioner on the LTR objectives, budgetary situation and the past and the planned activities, particularly those concerning the LTR Kigoma station. He further clarified the utilization of the R/V Tanganyika Explorer, explaining that (1) this vessel is under exclusive charter by the FAO until 27.4.1998, (2) the programme of work for this vessel during 1997 and (3) apologized for the misunderstanding caused by a confused request by the FAO Representation. He also indicated that the immediate requirements for the use of R/V Tanganyika Explorer will call for a scientific cruise which is scheduled for 1.2.-9.3.1997 and which will be restricted to the territorial waters of Tanzania. This cruise will be followed by one which will be devoted to the acoustic studies, lake-wide. The Hon. Commissioner stated that he does not forsee any problems from his side, promising at the same time that even in case the present situation in the northern region of the lake prevails, he will do his outmost to ensure the normal operation of the said vessel.

GH
14.1.97

NEW CAPITALBANK

MPL/AMS/bm

9 January 1997

Dr George Hanek
FAO Research Project
Lake Tanganyika
MPULUNGU

Dear Dr Hanek

ACCOUNT RELATIONSHIP

I wish to thank you for the good reception and time you accorded me when I called at your offices this morning. I valued the frank exchanges and trust that the meeting will lead to a cordial relationship between your Research Station and new Capital Bank Plc.

Our Head Office is situated on the First Floor Lotti HOUSE, Cairo Road, P O Box 36452 LUSAKA. Fax number 224055, Telex ZA 43830.

FOREIGN EXCHANGE SERVICES

We are able to open an interest free foreign currency account for you which will be maintained at our Head Office in Lusaka. Please arrange that transfers in US Dollars are credited to

Citibank N A
Citibank house
336 Strand
LONDON, WC 2R 1HB

For Account of New Capital Bank Plc Account No 005515181 or

Citibank N A
111 Wall Street
19th Floor, Zone 1
New York N Y 10043
U S A

For New Capital Bank Account no. 3601 - 7058.

2/...

The Kwacha account will be maintained in Mpulungu and will not attract any charges and no interest will be earned.

SERVICE EXCELLENCE

In all the services we offer, we pride ourselves in the high level of efficiency and personalized service.

On the whole, New Capital Bank Plc offers the entire range of banking services and we go out of our way to satisfy the unique needs of individual customers. We are looking forward to a cordial relationship with you and should you require clarification on any matter, please do not hesitate to get in touch with the Finance Director Mr Kapadia on 227303 Lusaka or the Foreign Operations Manager Mr Malupande on 227190 Lusaka or the undersigned on 455064 Mpulungu.

Yours sincerely
for and on behalf of
NEW CAPITAL BANK PLC

Anderson M Sichizuwe
SUB MANAGER

cc The Finance Director - New Capital bank Plc

cc The Foreign Operations Manager - New Capital Bank Plc